

L2 cDNA LIBRARY

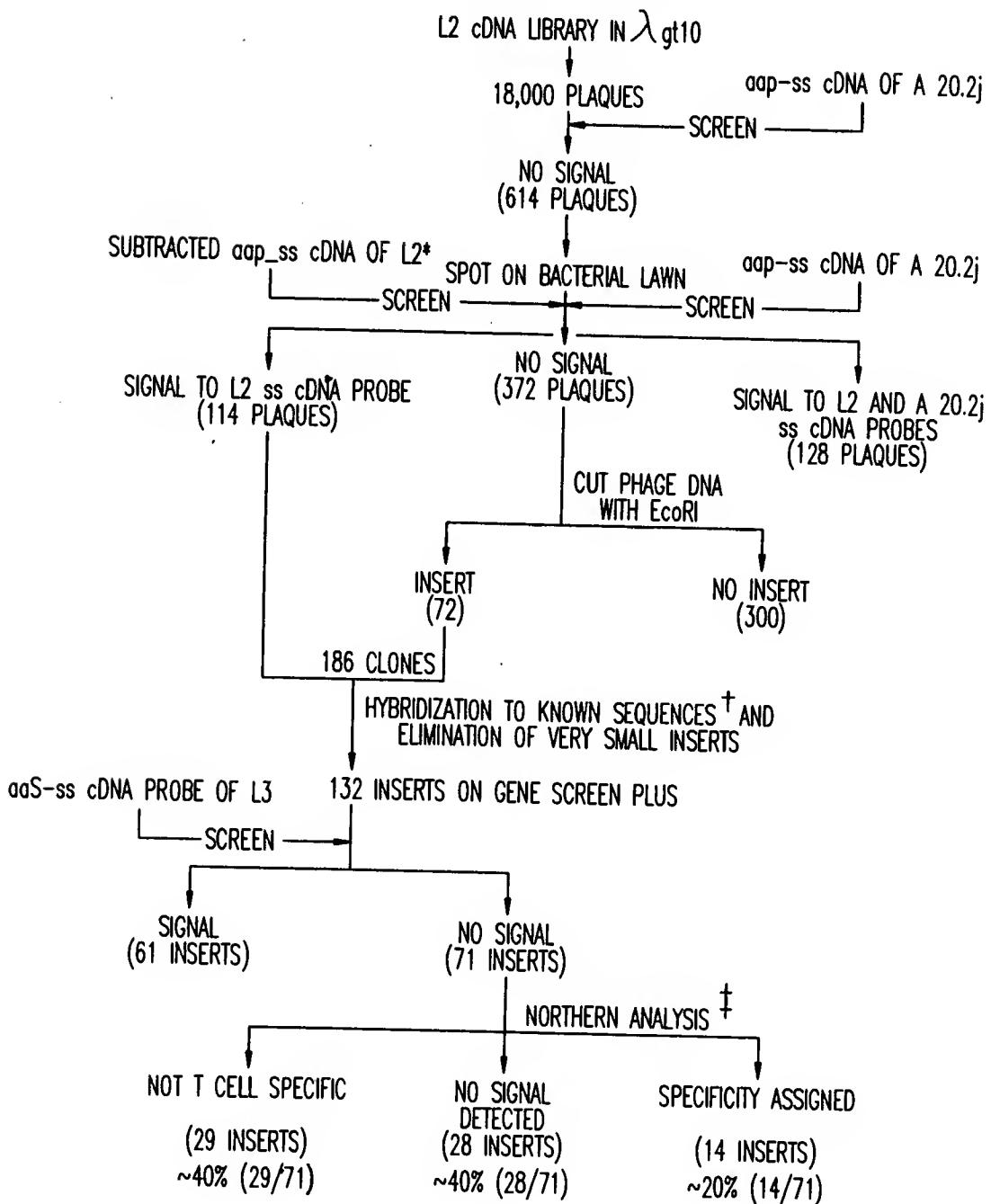


FIG. 1A

L3 cDNA LIBRARY

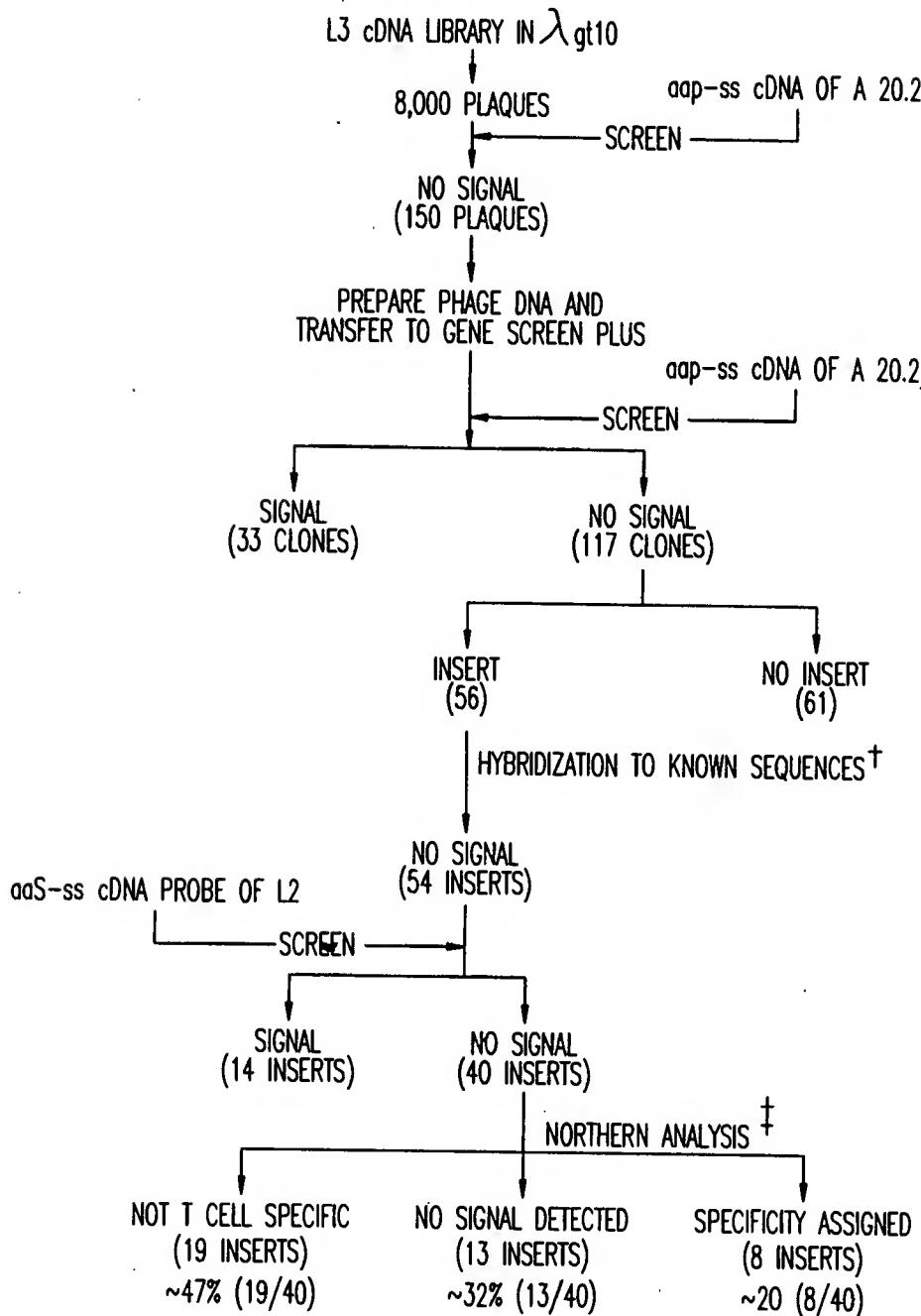


FIG. 1B

TITLE: MURINE 4-1BB GENE (as amended)  
 INVENTORS NAME: Byoung S. Kwon  
 SERIAL NO.: 08/012,269

3/38

-145 ATGTC  
 -140 CATGAACTGC TGAGTGGATA AACACCCACGG CATACTCTGC TCTAAAGGAA TATTACTACA CCAGGAAAG  
 -70 GACACATTGC ACAACAGGAA ACCACCCCTGT CACAGAAAAC CACAGTGTCC TCTCCATGTG ACATTTGCC  
 1 ATG GGA AAC AAC TGT TAC AAC GTG GTG GTC ATT GTG CTG CTA GTG GGC TGT GAG AAG 60  
 1 Met Gly Asn Asn Cys Tyr Asn Val Val Val Ile Val Leu Leu Leu Val Gly Cys Glu Lys 20  
 61 GTG GGA GCC GTG CAG AAC TCC TCT GAT AAC TGT CAG CCT GGT ACT TTC TCC AGA AAA TAC 120  
 21 Val Gly Ala Val Gln Asn Ser Cys Asp Asn Cys Gln Pro Gly Thr Phe Cys Arg Lys Tyr 40  
 121 AAT CCA GTC TGC AAG AGC TGC CCT CCA ACT ACC TTC TCC AGC ATA GGT GGA CAG CCG AAC 180  
 41 Asn Pro Val Cys Lys Ser Cys Pro Pro Ser Thr Phe Ser Ser Ile Gly Gly Gln Pro Asn 60  
 181 TGT AAC ATC TCC AGA GTG TGT GCA GGC TAT TTC AGG TTC AAG AAC TTT TGC TCC TCT ACC 240  
 61 Cys Asn Ile Cys Arg Val Cys Ala Gly Tyr Phe Arg Phe Lys Lys Phe Cys Ser Ser Thr 80  
 241 CAC AAC GCG GAG TGT GAG TCC ATT GAA GGA TTC CAT TGC TTG GGG CCA CAG TGC ACC AGA 300  
 81 His Asn Ala Glu Cys Glu Cys Ile Glu Gly Phe His Cys Leu Gly Pro Gln Cys Thr Arg 100  
 301 TGT GAA AAG GAC TGC AGC CCT GGC CAG CAG CTA ACG AAG CAG GGT TGC AAA ACC TGT AGC 360  
 101 Cys Glu Lys Asp Cys Arg Pro Gly Gln Glu Leu Thr Lys Gln Gly Cys Lys Thr Cys Ser 120  
 361 TTG GGA ACA TTT AAT GAC CAG AAC GGT ACT GGC GTC TGT CGA CCC TGG ACC AAC TGC TCT 420  
 121 Leu Gly Thr Phe Asn Asp Gln Asn Gly Thr Gly Val Cys Arg Pro Trp Thr Asn Cys Ser 140  
 421 CTA GAC GGA AGC TCT GTC CTT AAG ACC GGG ACC ACG GAG AAG GAC GTC GTC TGT CGA CCC 480  
 141 Leu Asp Gly Arg Ser Val Leu Lys Thr Gly Thr Thr Glu Lys Asp Val Val Cys Gly Pro 160  
 481 CCT GTG GTG ACC TTC TCT CCC ACT ACC ACC ATT TCT GTG ACT CCA GAC GGA GGA CCA GGA 540  
 161 Pro Val Val Ser Phe Ser Pro Ser Thr Thr Ile Ser Val Thr Pro Glu Gly Cys Pro Gly 180  
 541 GGG CAC TCC TTG CAG GTC CTT ACC TTG TTC CTG GCG CTG ACA TCC GCT TTG CTG CTG GCC 600  
 181 Gly His Ser Leu Gln Val Leu Thr Leu Phe Leu Ala Leu Thr Ser Ala Leu Leu Ala 200  
 601 CTG ATC TTC ATT ACT CTC CTG TTC TCT GTG CTC AAA TGG ATC AGC AAA AAA TTC CCC CAC 660  
 201 Leu Ile Phe Ile Thr Leu Leu Phe Ser Val Leu Ile Trp Ile Arg Lys Phe Pro His 220  
 661 ATA TTC AAG CAA CCA TTT AAG AAG ACC ACT GGA GCA GCT CAA GAG GAA GAT GCT TGT AGC 720  
 221 Ile Phe Lys Gln Pro Phe Lys Lys Thr Thr Gly Ala Ala Gln Glu Asp Ala Cys Ser 240  
 721 TGC CGA TGT CCA CAG GAA GAA GGA GGA GGA GCA GGC TAT GAG CTG TGA TGTACTATC 780  
 241 Cys Arg Cys Pro Gln Glu Glu Gly Gly Gly Tyr Glu Leu ---

FIG. 2A

TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

4/38

781	CTAGGAGATG TCTGGCCCCA AACCGAGAAC CACTAGGACC CCACCATCCT CTGGAACAGC ACAAGCAACC	850
851	CCACCACCCCT GTTCTTACAC ATCATCCTAG ATGATGTGTG CCCGGCCACC TCATCCAAGT CTCTTCTAAC	920
921	GCTAACATAT TTGTCTTTAC CTTTTTAAA TCTTTTTTA AATTTAAATT TTATGTGTG GACTGTTTC	990
991	CCTGCCTGTA TCCACACCGTC TCTGTGTGT TGTGTGTAC ACTCCCTCATC CCTGACCGAG TCAGAACAGA	1060
1061	AACGGTTGGT TCCATAAGAA CTGGACTTAT GGATGGCTGT GAGCCGGnnn GATAGCTCGG GACGGAGACC	1130
1131	TGTCTTCTTA TTTTAACGTG ACTGTAT <del>AT</del> <del>AAA</del> AAAAAAA TGATATTTCG GGAATTGTAC AGATTGTCCCT	1200
1201	GACACCCCTTC TAGTTAACGTA TCTAACAGGA ATTGTTGATA CCTACTATAC TCTATATGTG TATGTATATG	1270
1271	TATATGTATA TATAAGACTC TTTTACTCTC AAAGTCAACC TAGACTGTCT GTTACCCAGG TCAATTTAT	1340
1341	TGGACATTT ACGTCACACA CACACACACA CACACACACA CACGTTATA CTACGTACTGT TATCGGTAT	1410
1411	TCTACGTCAAT ATAATGGGAT ACGGTAAGG GAAACCAAAG AGTGAGTGAT ATTATTTGTGGA GGTGACACAGA	1480
1481	CTACCCCTTC TGGGTACGTA GGGACAGACC TCCTCGGAC TGTCTAAAC TCCCCTTAGA ACTCTCGTCA	1550
1551	AGTTCCCGGA CGAACAGGAC AGAGGAGACA CACTCCGAAA AGTTATTTT CCGGCAAATC CTTTCCCTGT	1620
1621	TTCTGTACAC TCCACCCCTT GTGGACACTT GACTGTCACTC CTTGGGGCCCG AAGGTCAAGGT GGTACCCGTC	1690
1691	TCTAGGGGCC GGGAGACAGA CCCGGGGGGG AGCTACGAGA ATCGACTCAC AGGGCGCCCC GGGCTTCGCA	1760
1761	AATGAAACTT TTTAACGTC ACAAGTTTCG TCCGGGCTCG CGGGACCTAT GCGGTGATC CTTATTACCT	1830
1831	TATCCTGGCG CCAAGATAAA ACAACCAAAA GCCTTGACTC CGGTACTAAT TCTCCCTGCC GGGCCCCGTA	1900
1901	ACCATAACGC GGGATCTCC ACTTTAACAA CCTGGGGGGG TTCTGCCTGG TCTCCCTTTC GTAAACGGTT	1970
1971	CTTACAAAAG TAATTACTTC TTGCTTTCAG CCTCCAAGCT TCTGCTACTC TATGCCACCA TCAAGGCTGG	2040
2041	TATTTGCTAC GGCTGACCCG TACGGGGGGG CAATAAGGT ACTGGGGGGC CCGTGAAGG CCCTTGGTT	2110
2111	TCAGAAACCC AAGGGCCCCC TCATACCAAC CTTTGCACCT TGATTCTTCC CGGTACGTGG TGCTGGCTGC	2180
2181	CTTAGCTCTT TCTCGATACT TAG AC	

FIG. 2B

TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

5/38

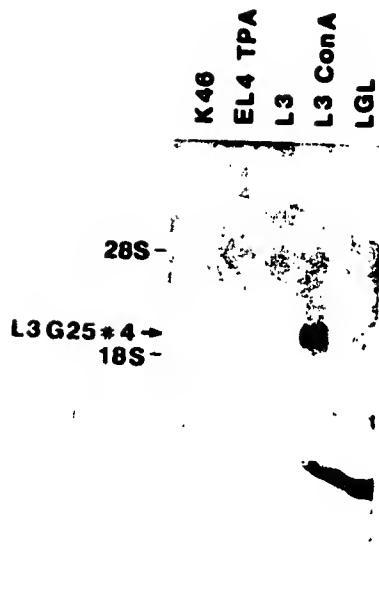


FIG. 3A

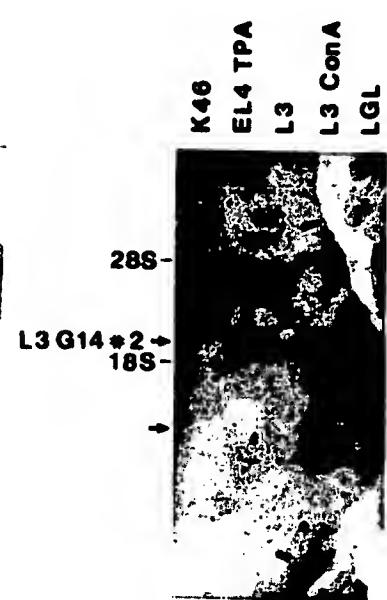


FIG. 3B

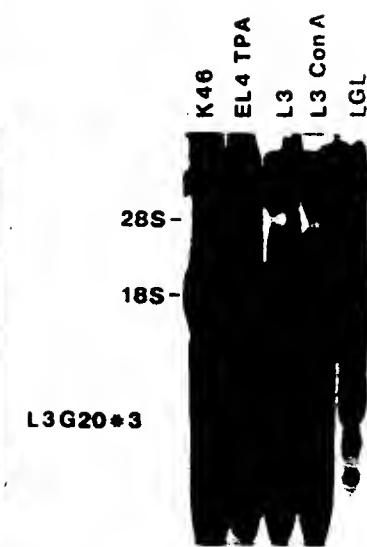


FIG. 3C

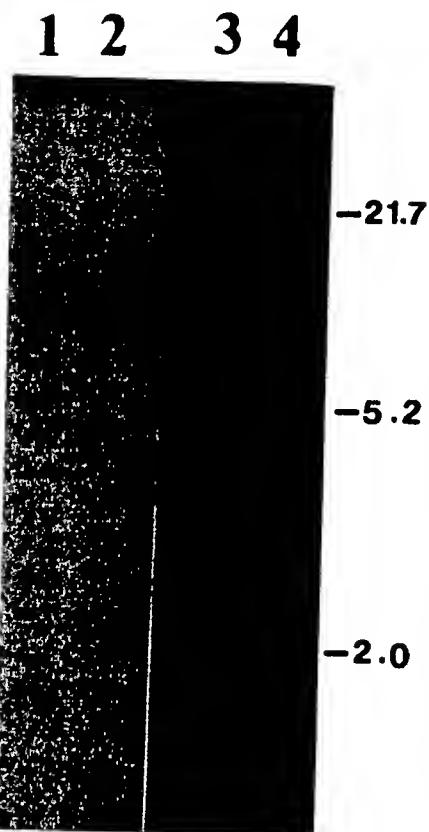


FIG. 4

TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

6/38

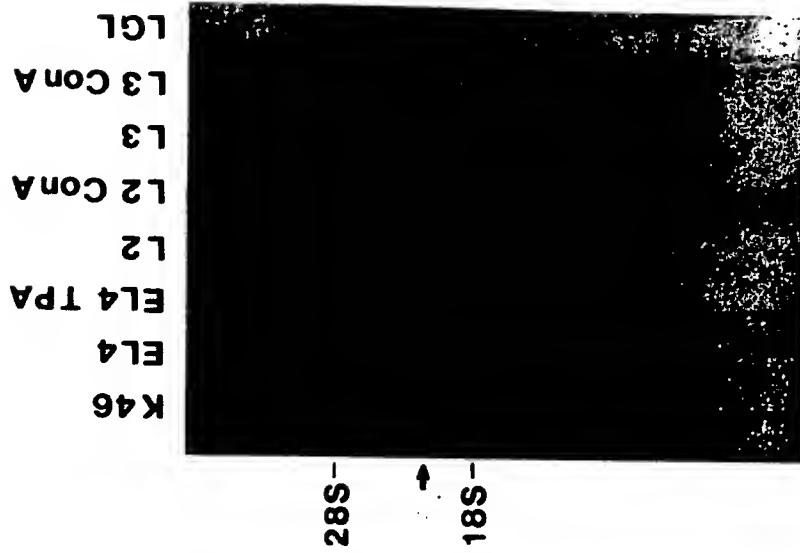


FIG. 5B

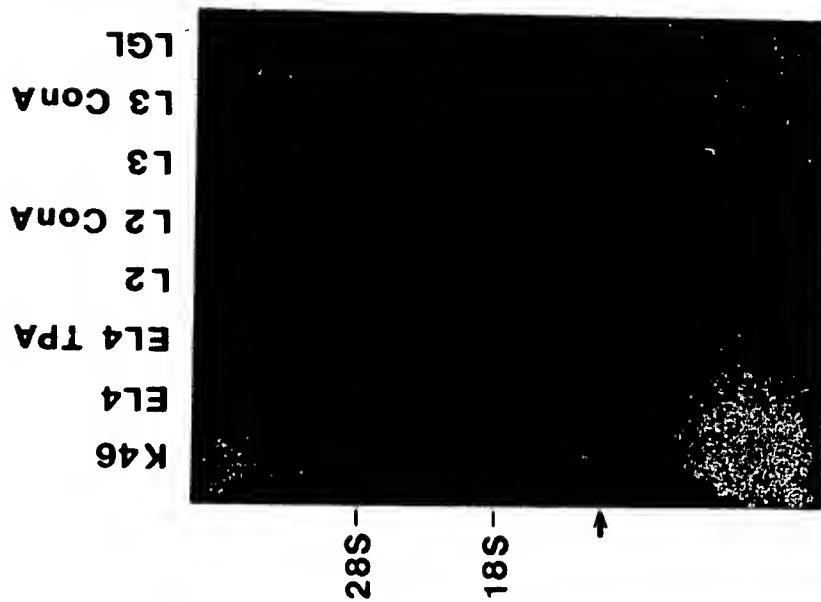
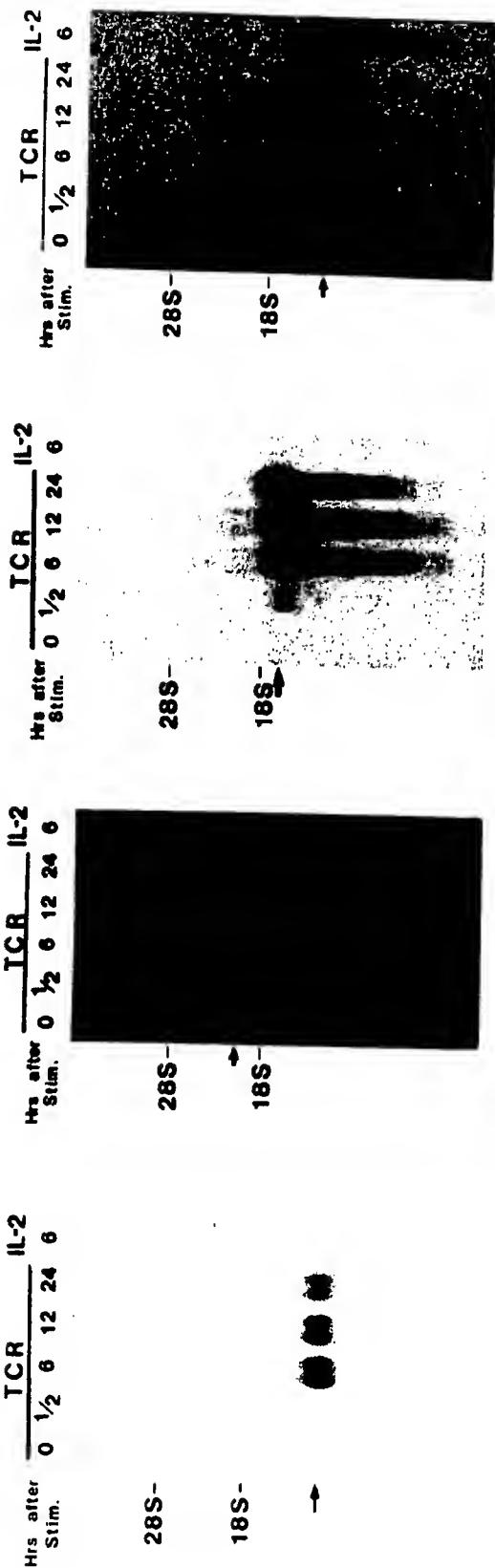


FIG. 5A

TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

7/38



TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

8/38

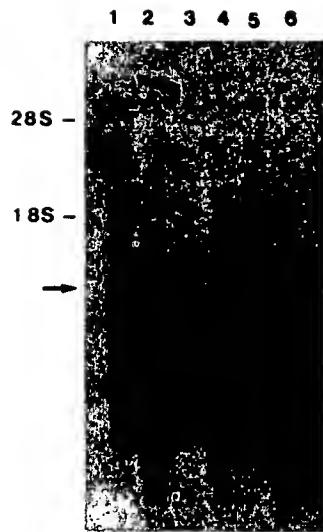


FIG. 7A



FIG. 7B

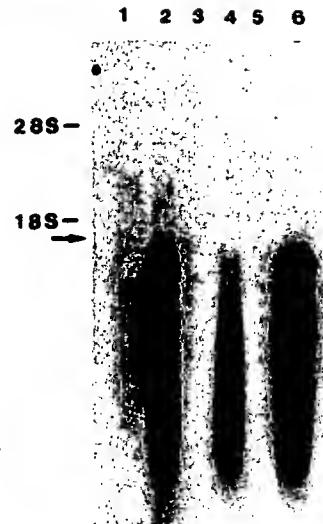


FIG. 7C

BW5147 ConA  
Md90 ConA  
Md90 ConA  
PN37 ConA  
PN37 ConA

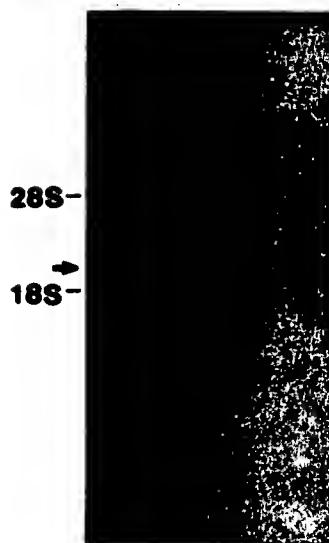


FIG. 8A

L2  
A11  
L3  
Melanocyte

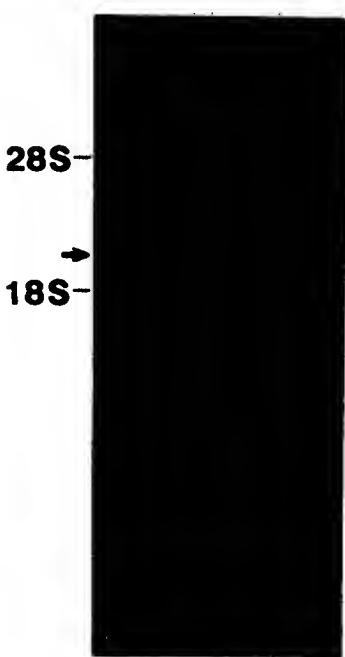
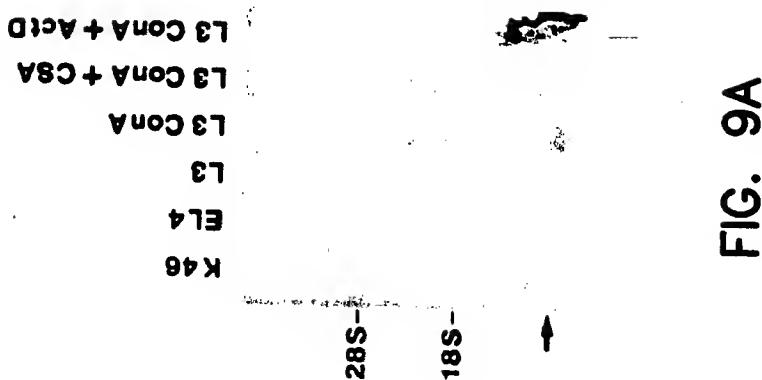
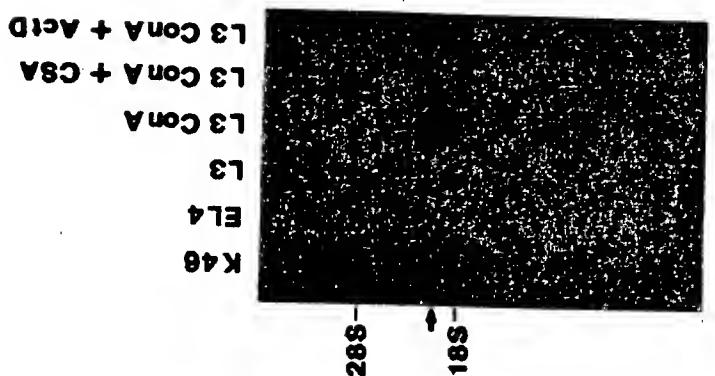
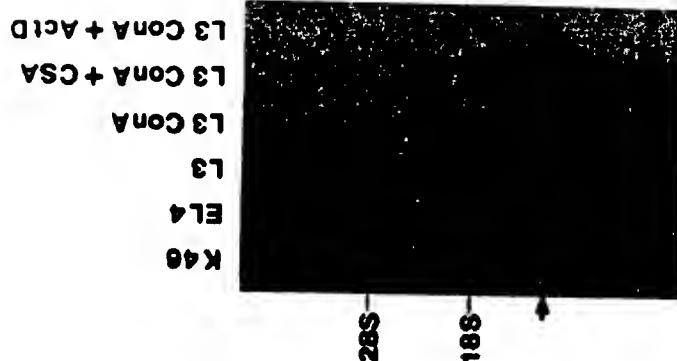


FIG. 8B

TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

9/38



TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

10/38

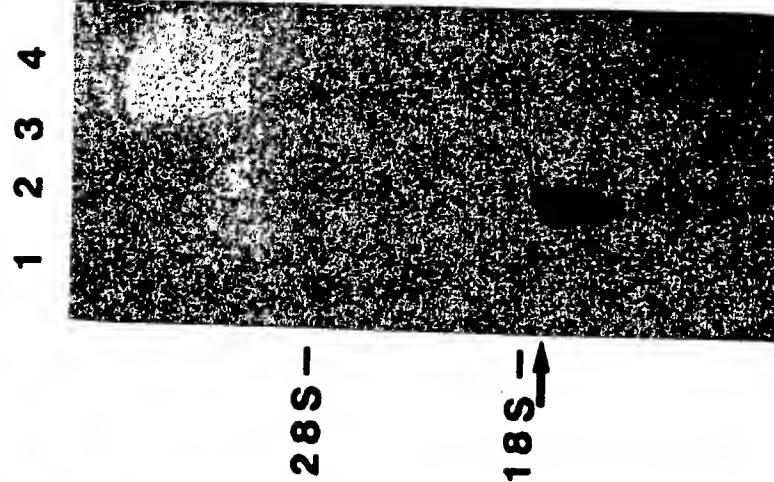


FIG. 10C

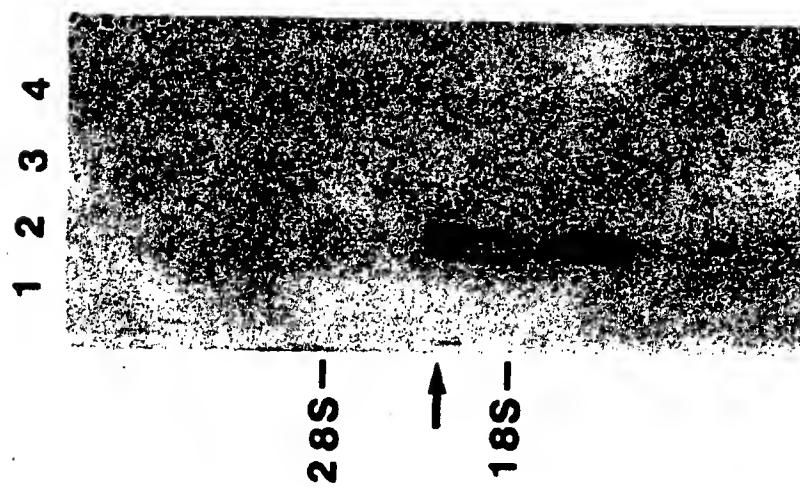


FIG. 10B

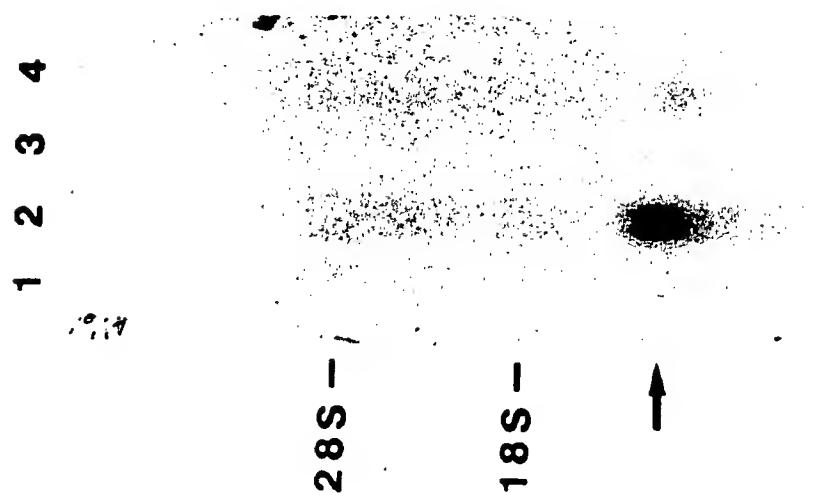
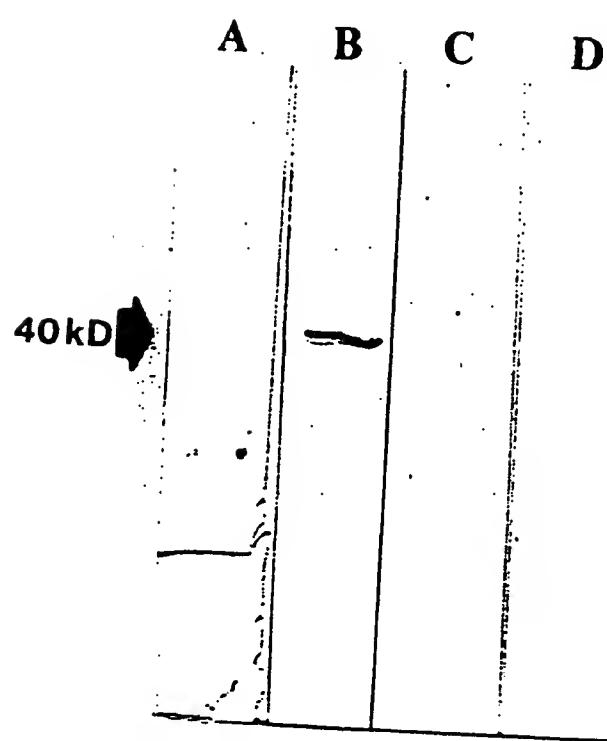
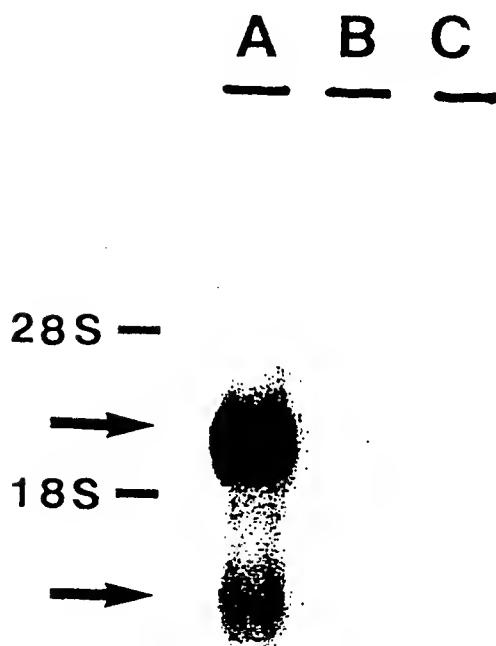


FIG. 10A

TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

11/38



TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

12/38

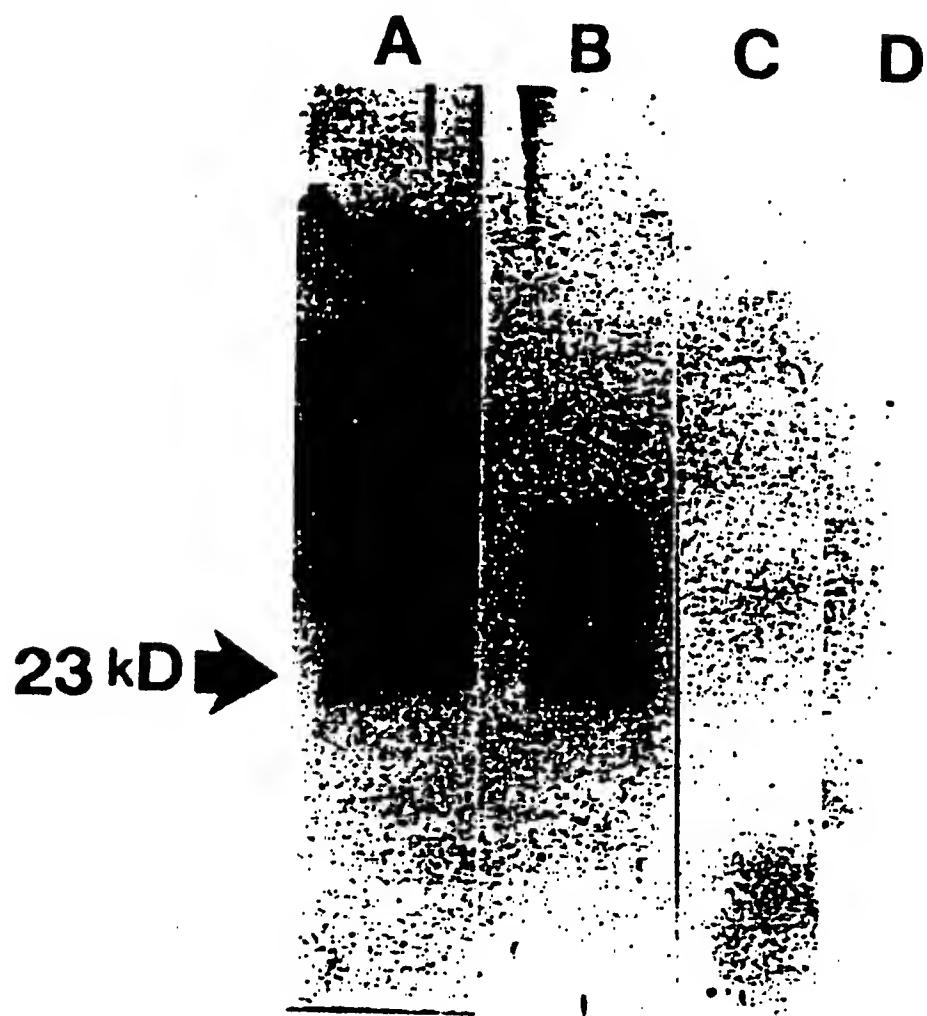


FIG. 13

TITLE: MURINE 4-1BB GENE (as am. filed)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

13/38

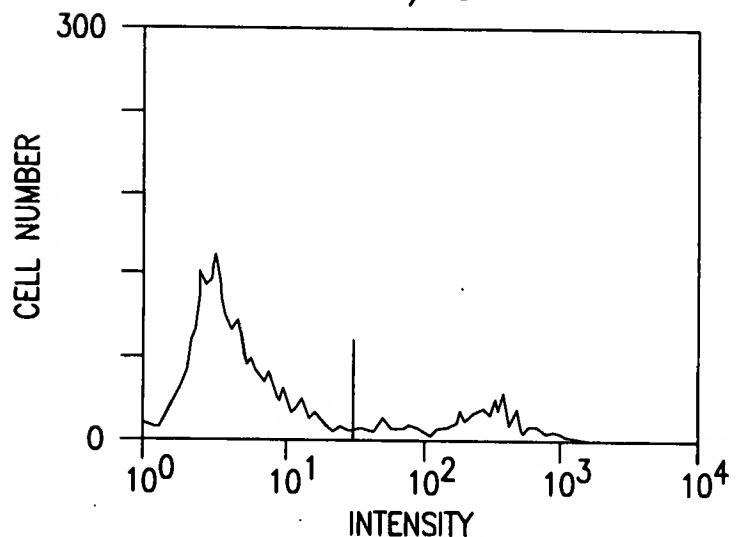


FIG. 14A

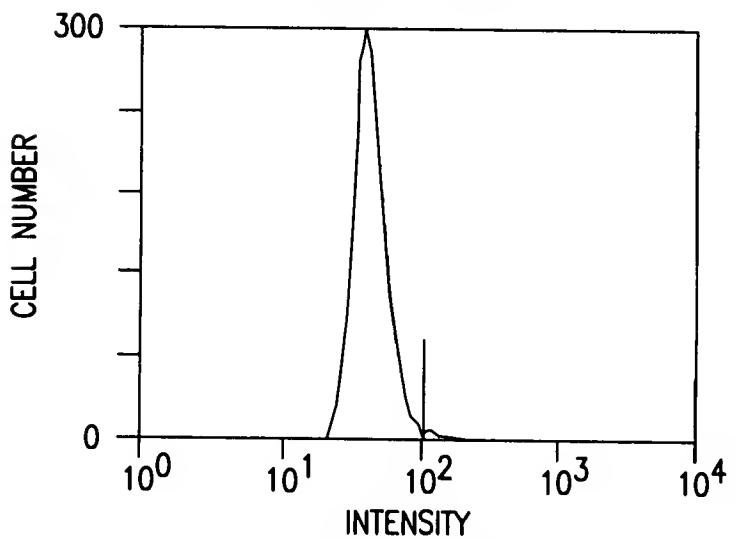


FIG. 14B

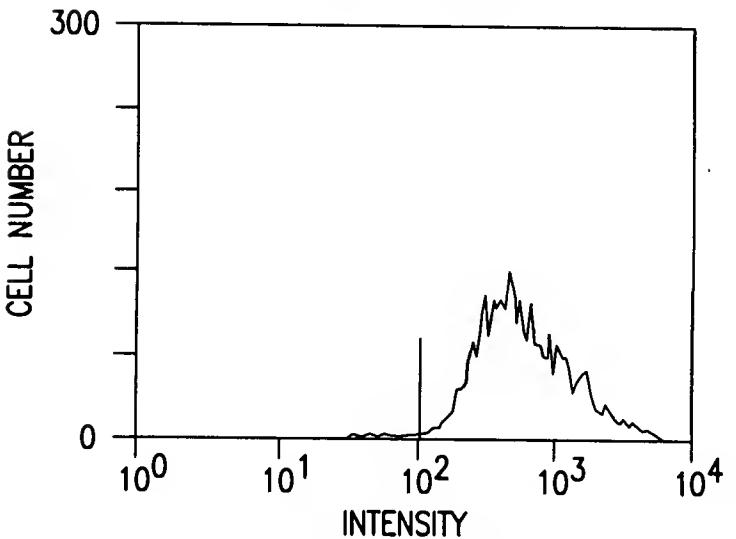


FIG. 14C

TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

14/38

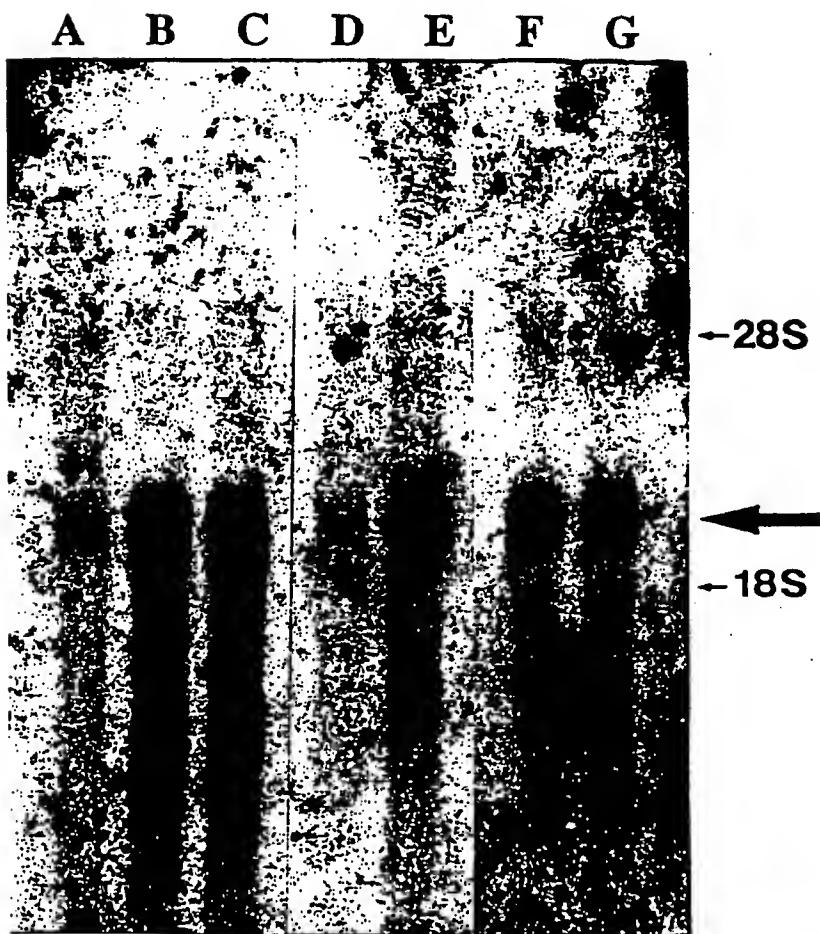


FIG. 15

TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

15/38

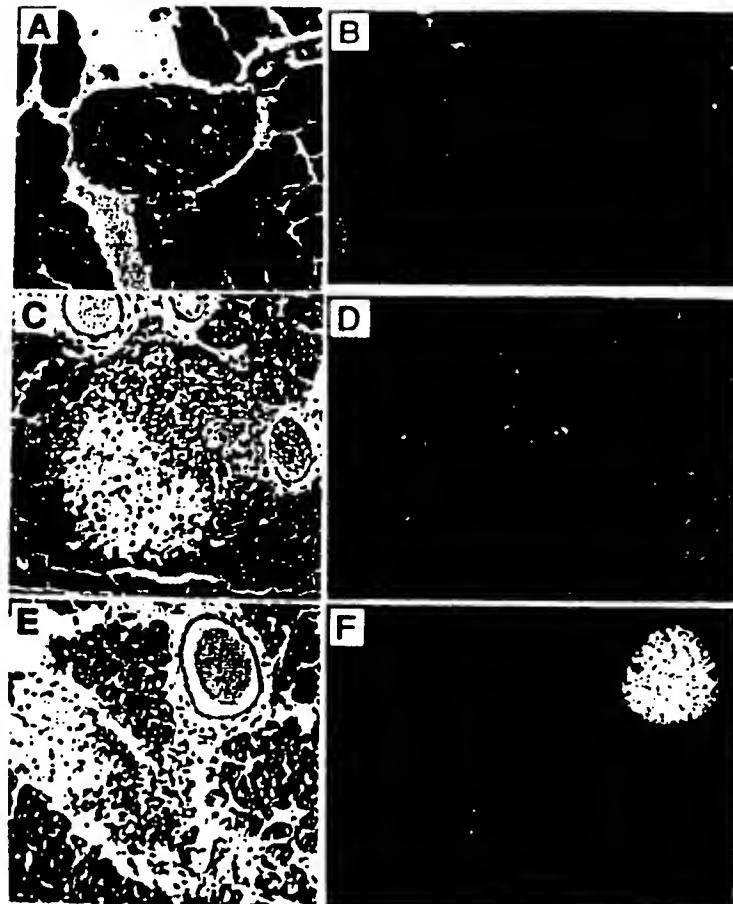


FIG. 16

TITLE MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

16/38

(64) C R V C A G Y F R F K K - - F - C S S T H N A E C - E C  
(71) C P V C F D Y V V - - - - I L Q C S S G H L V - C V S C  
(25) C P I C F E F I - Y K K Q I Y Q C K S G H H A - C K E C

4-1BB  
Sina  
DG17

FIG. 17

TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

17/38

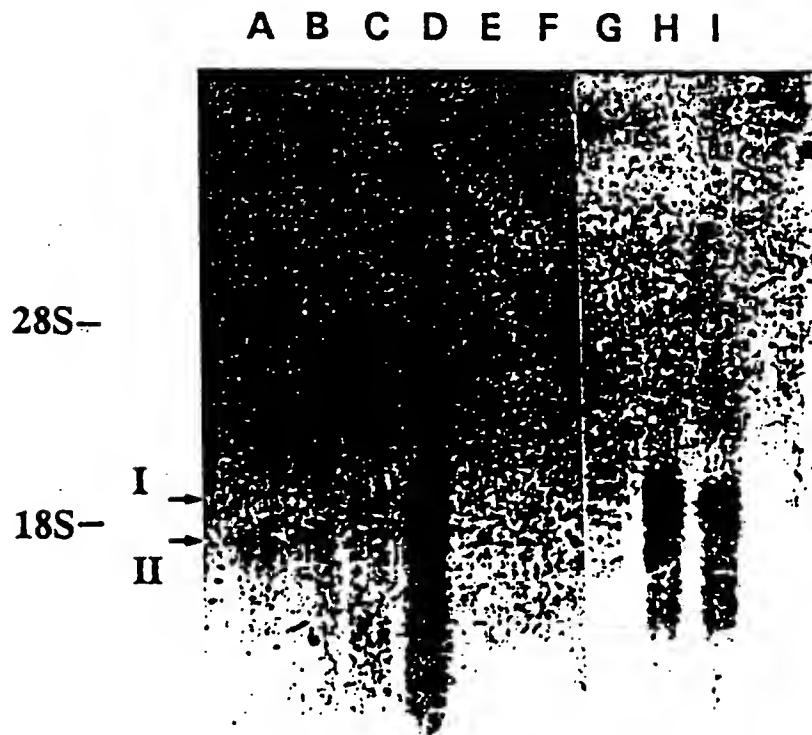


FIG. 18

TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

18/36

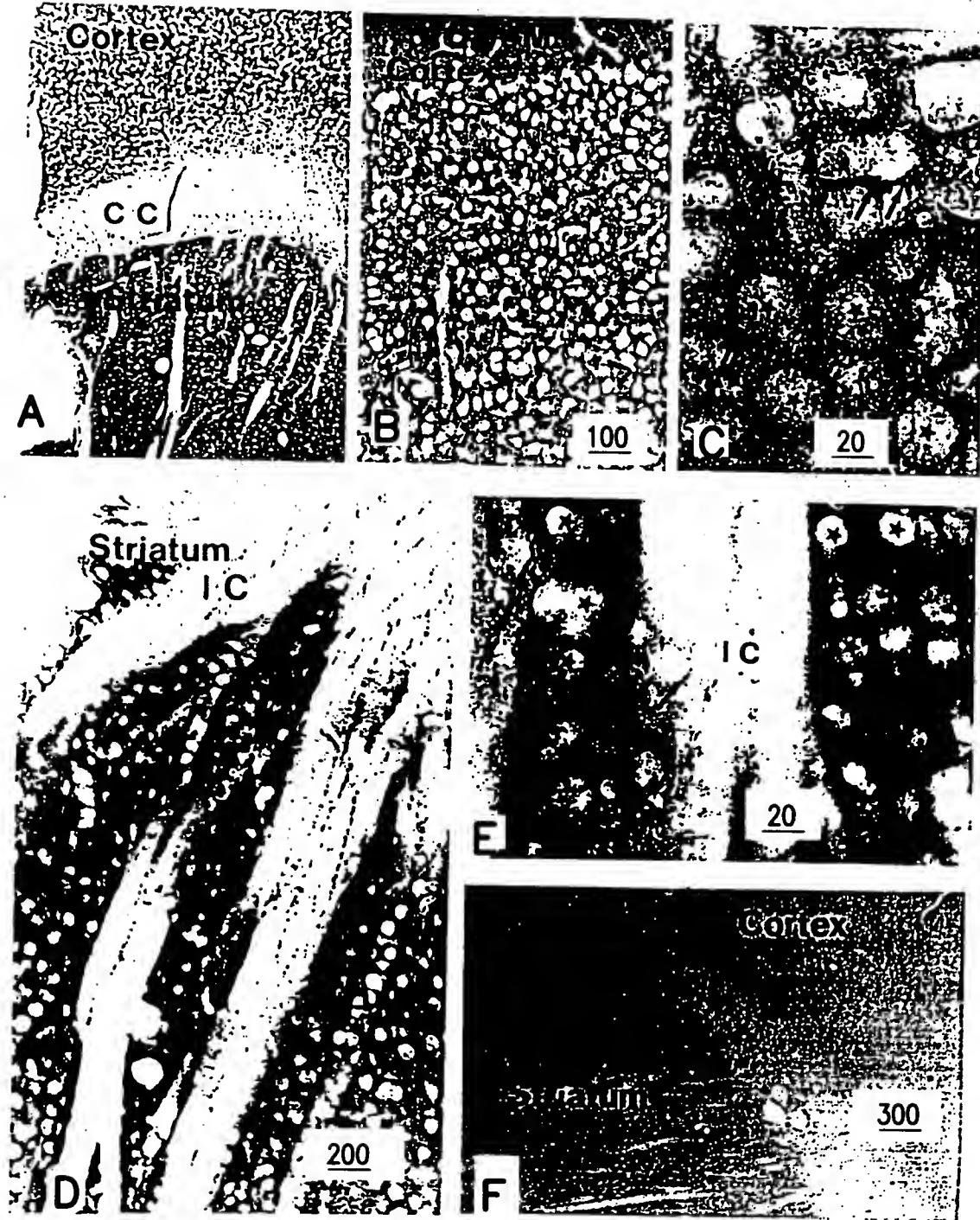


FIG. 19

TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

19/38

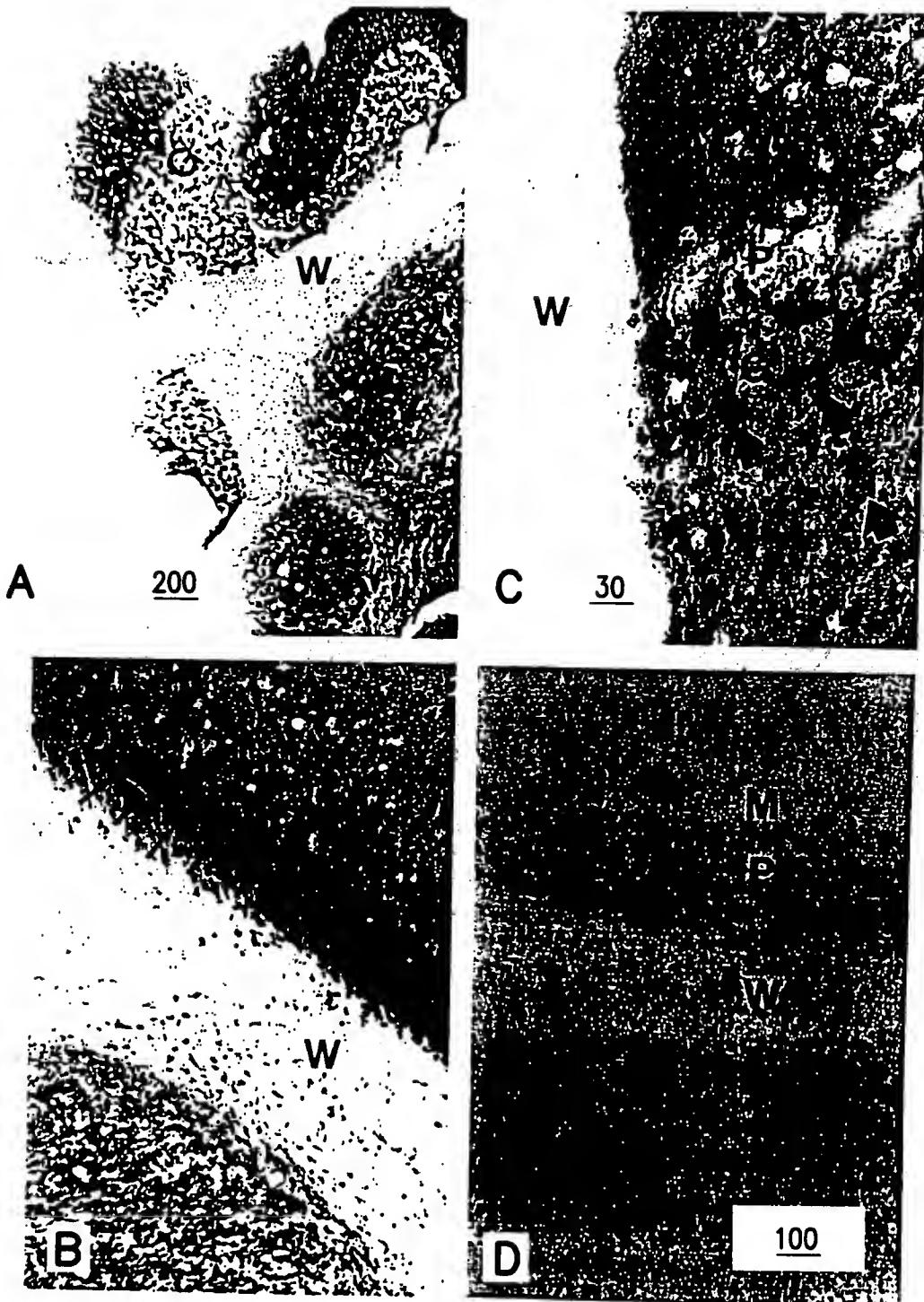


FIG. 20

TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

20/38

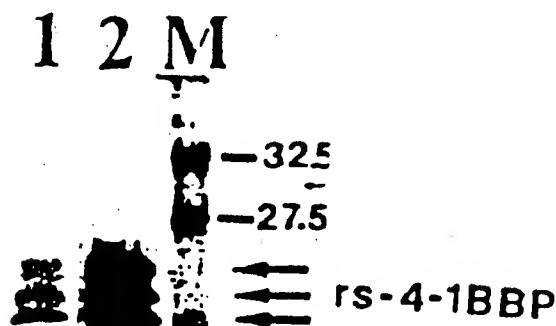


FIG. 21

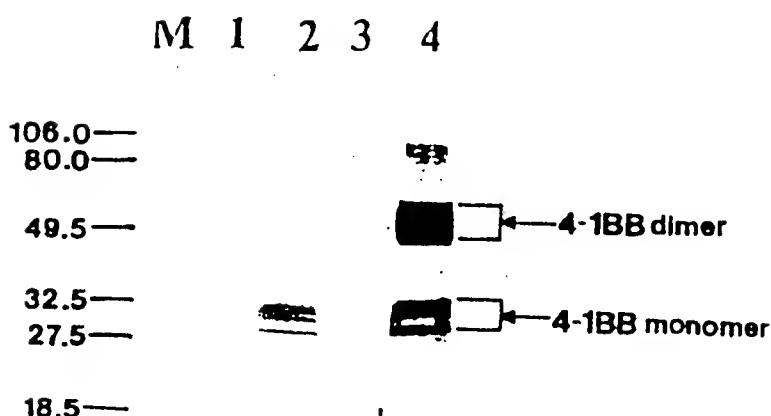


FIG. 22

TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

21/38

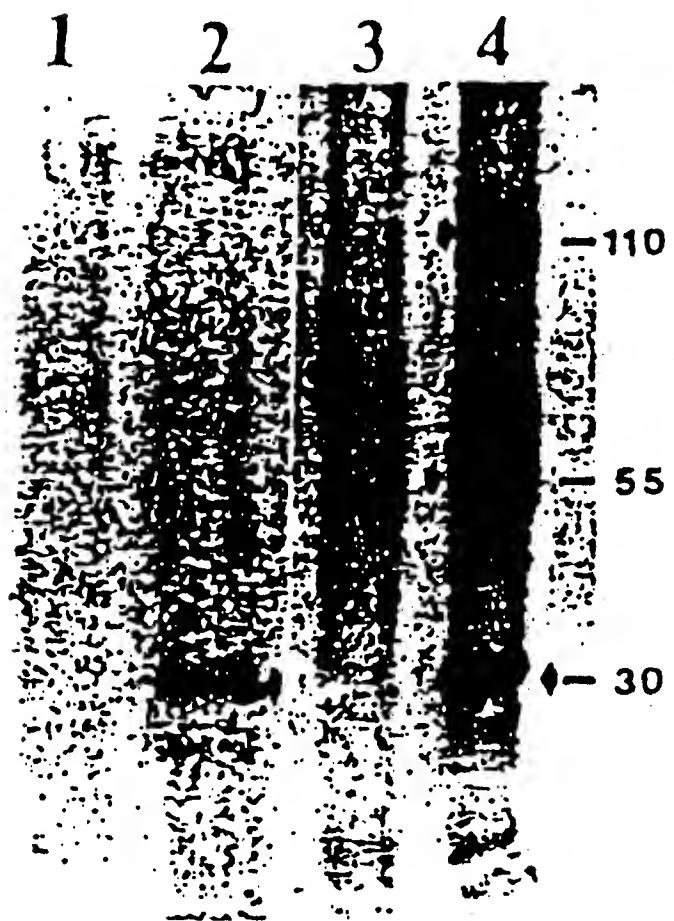
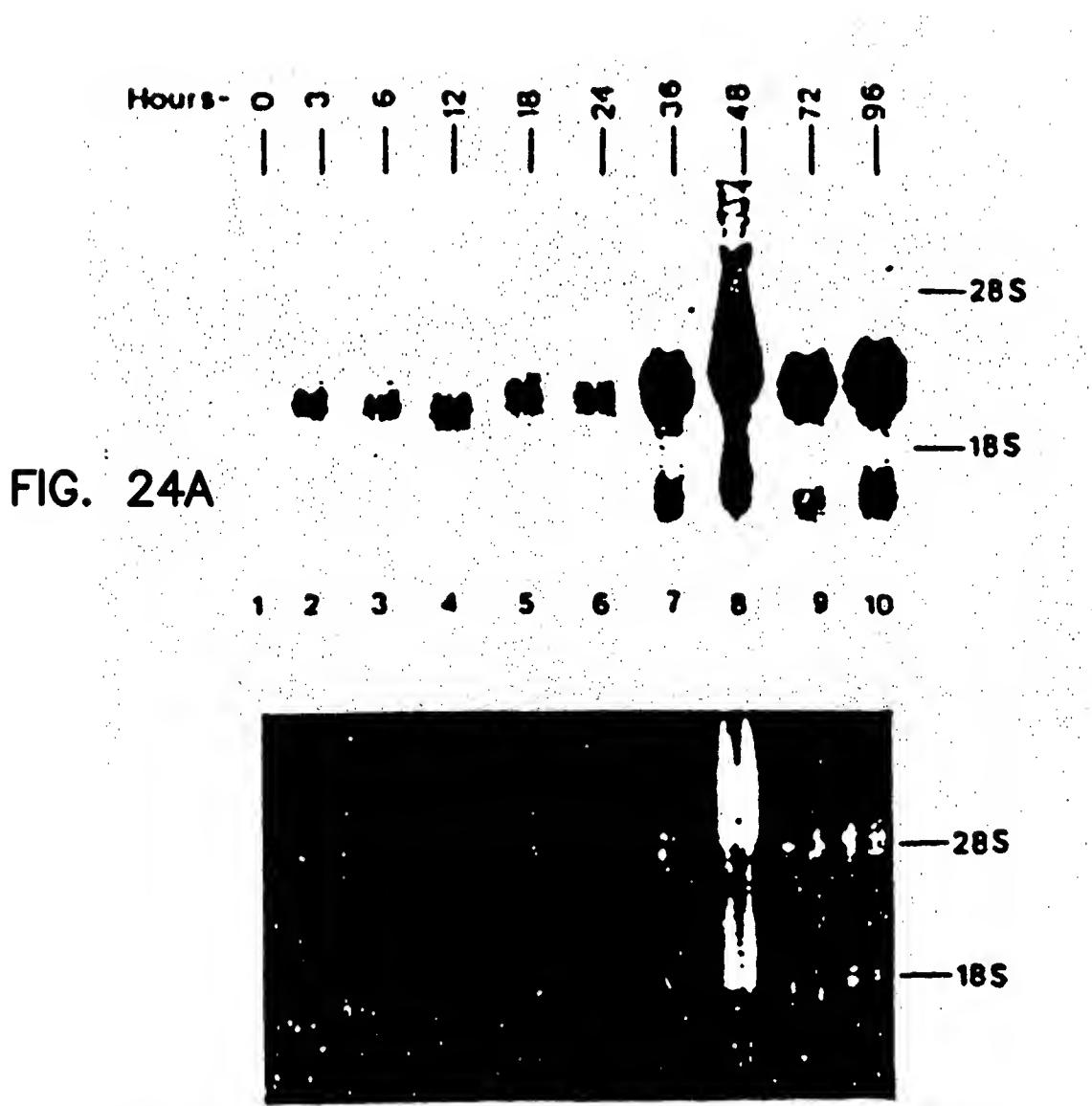


FIG. 23

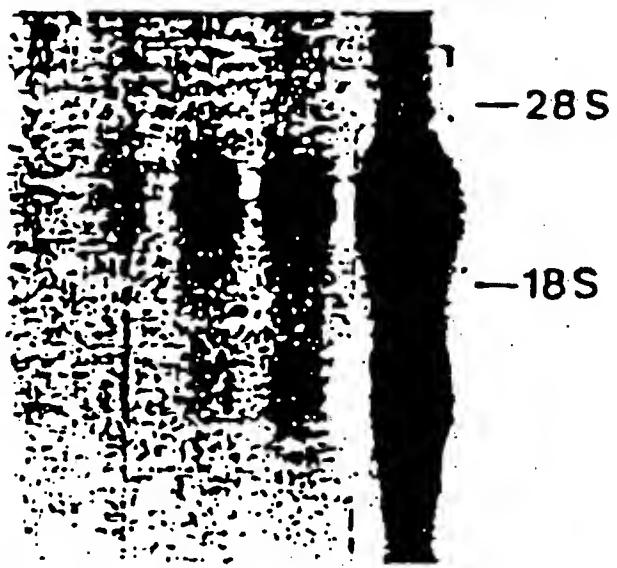
22/38



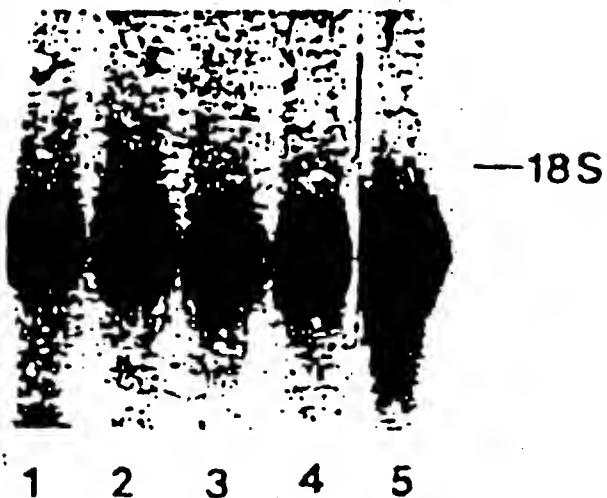
TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

23/38

**FIG. 25A**



**FIG. 25B**



TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

24/38

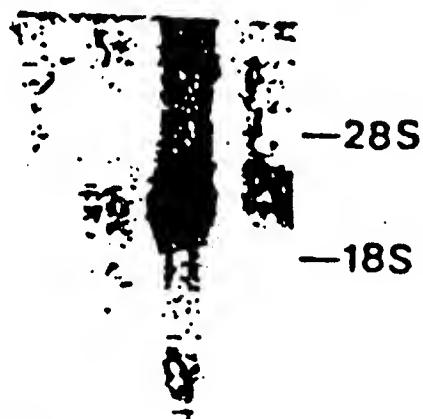


FIG. 26A



FIG. 26B

TIT MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

25/38

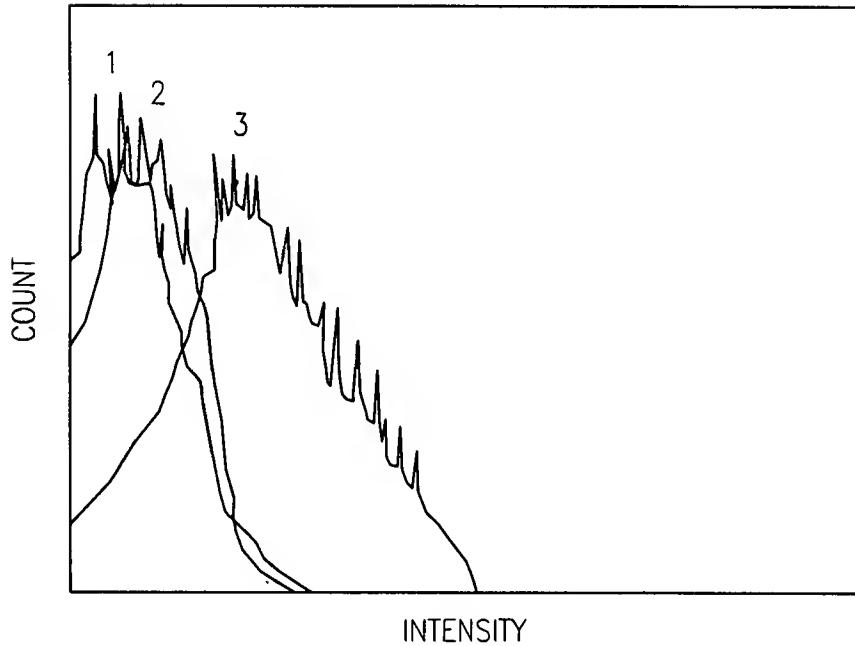


FIG. 27A

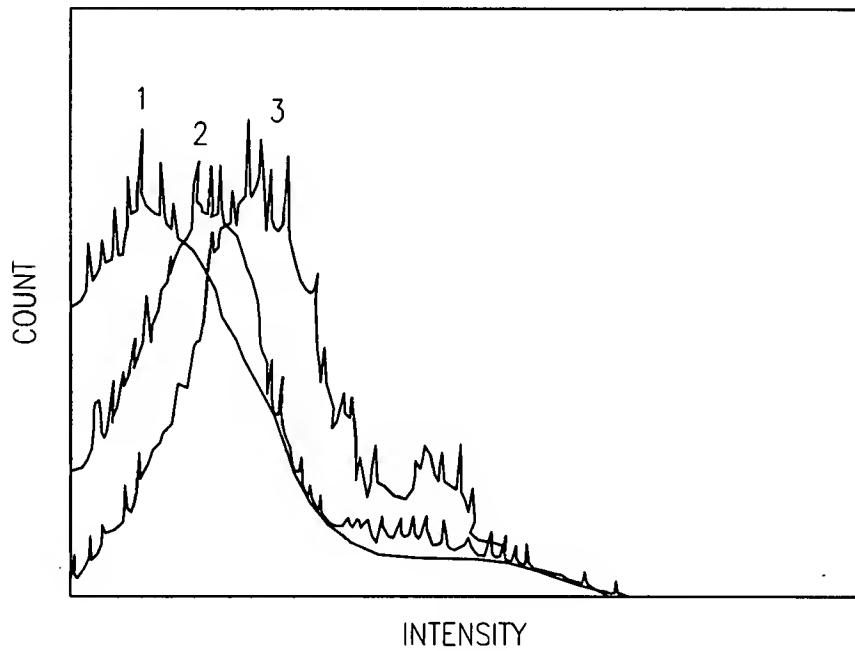


FIG. 27B

TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

26/38

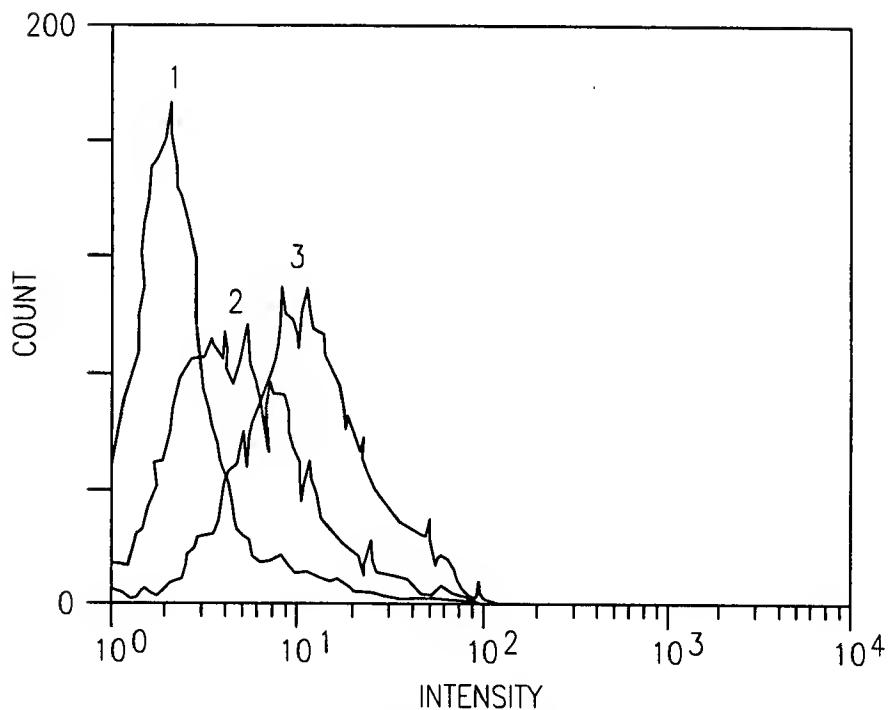


FIG. 27C

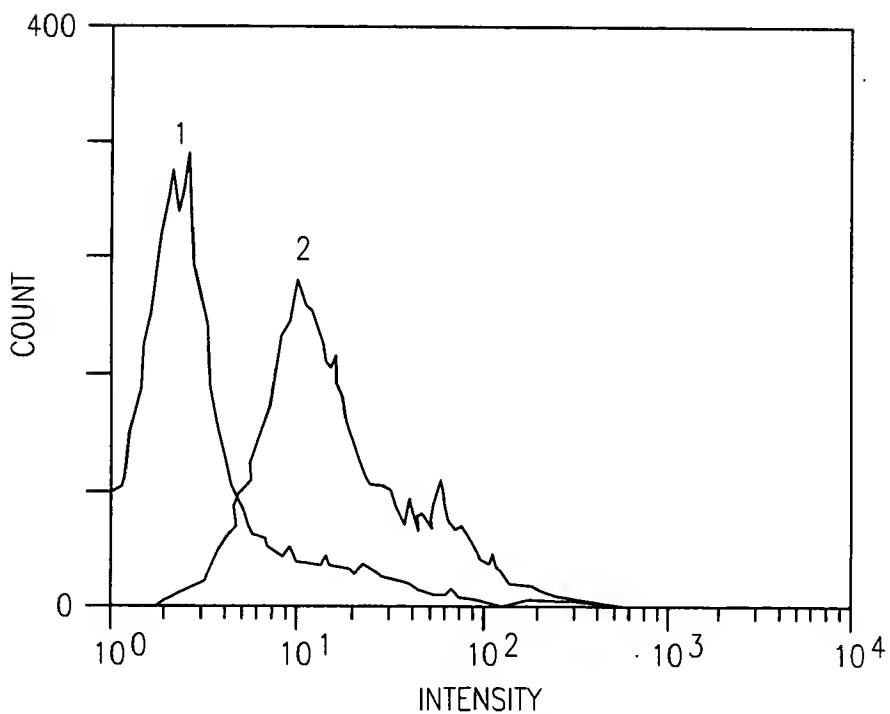


FIG. 27D

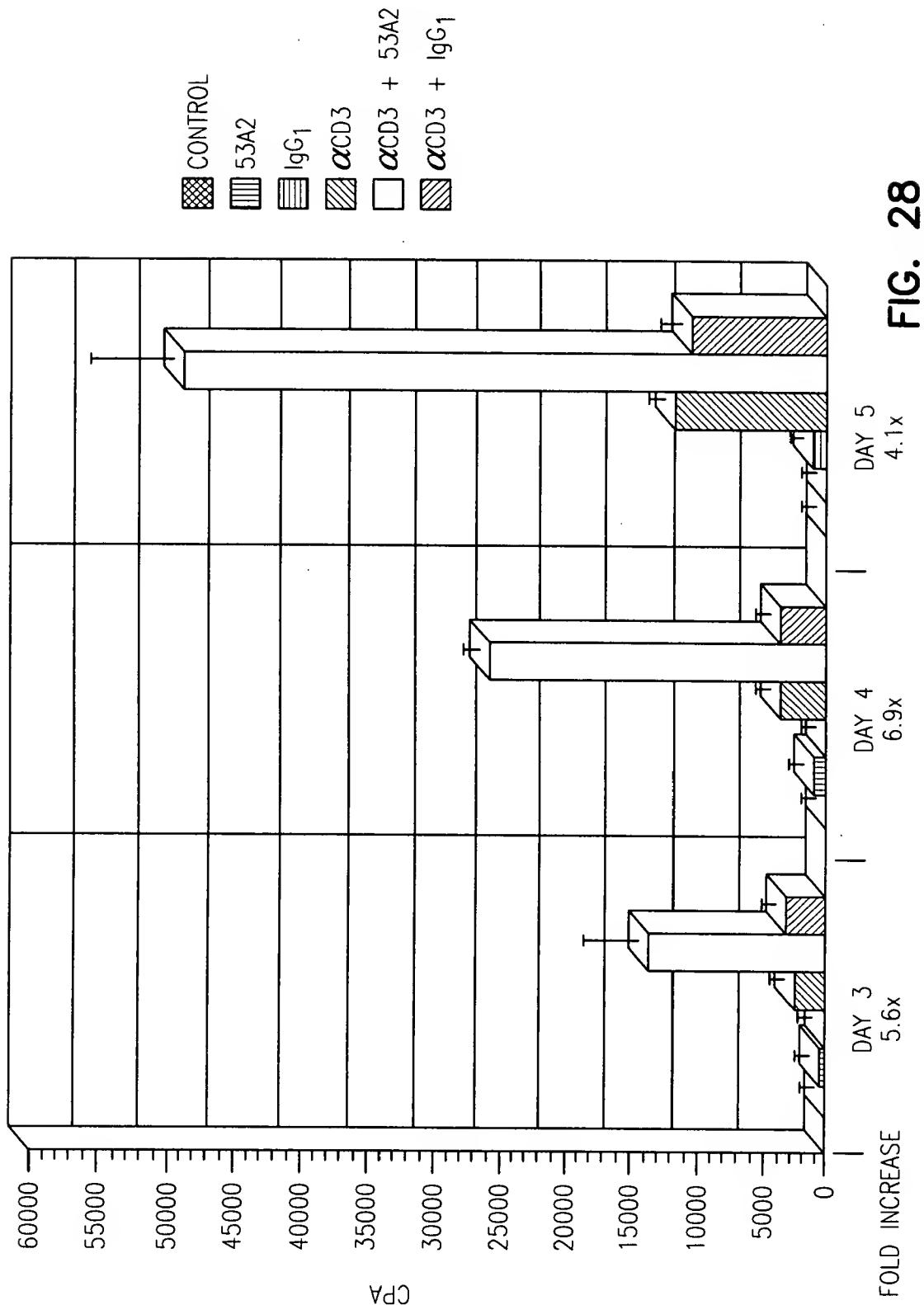


FIG. 28

TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

28/38

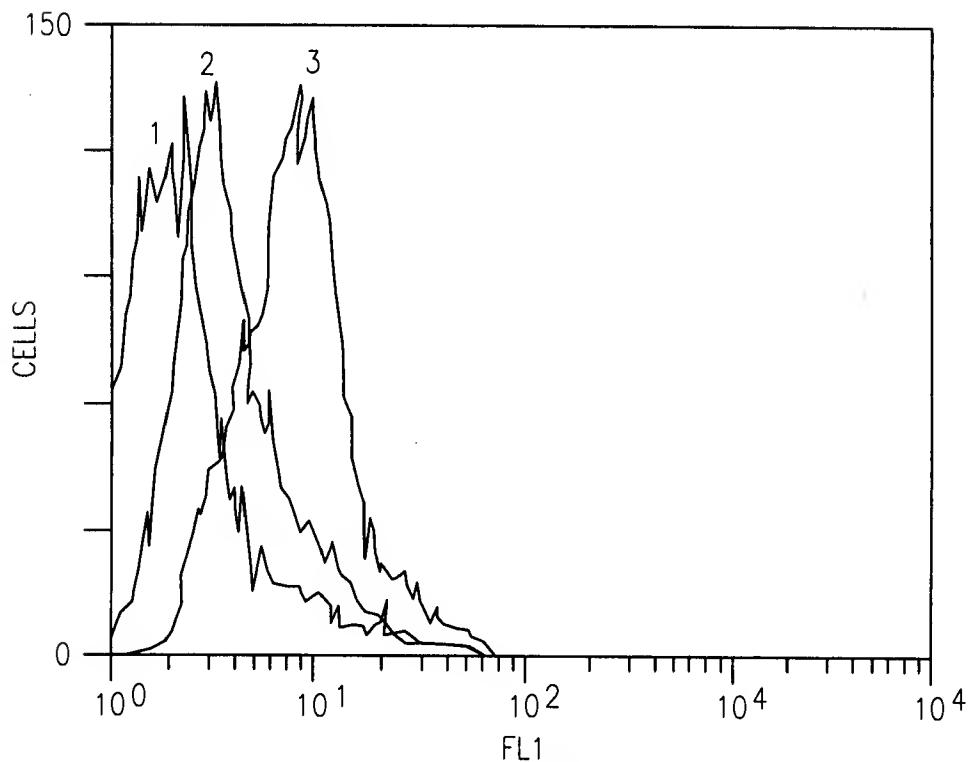


FIG. 29A

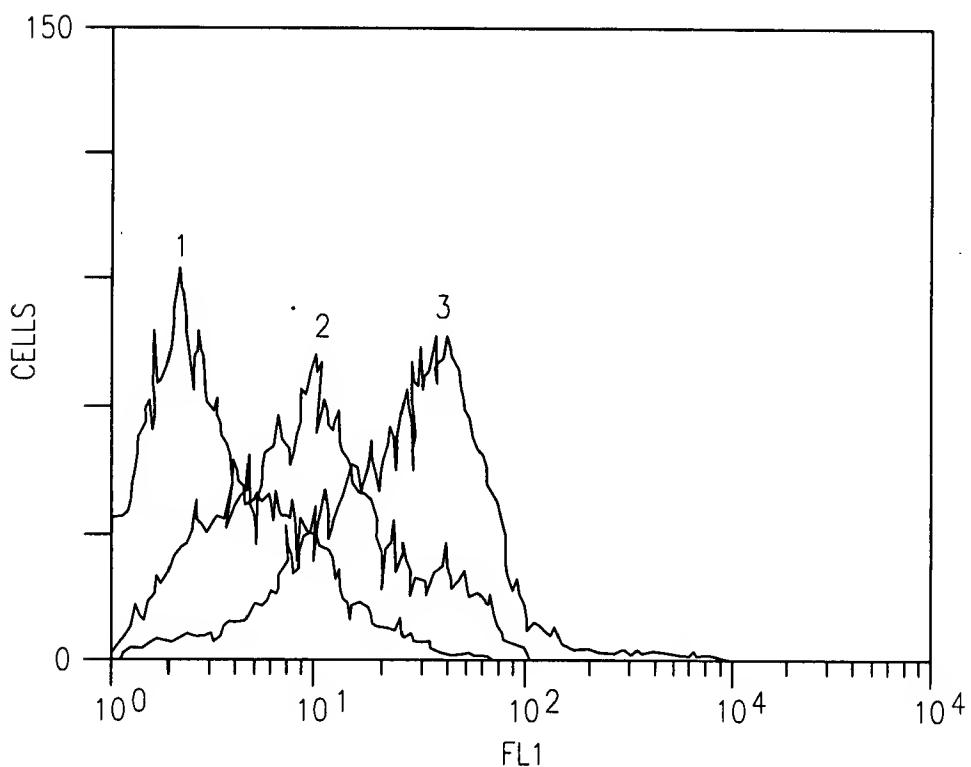


FIG. 29B

TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

29/38

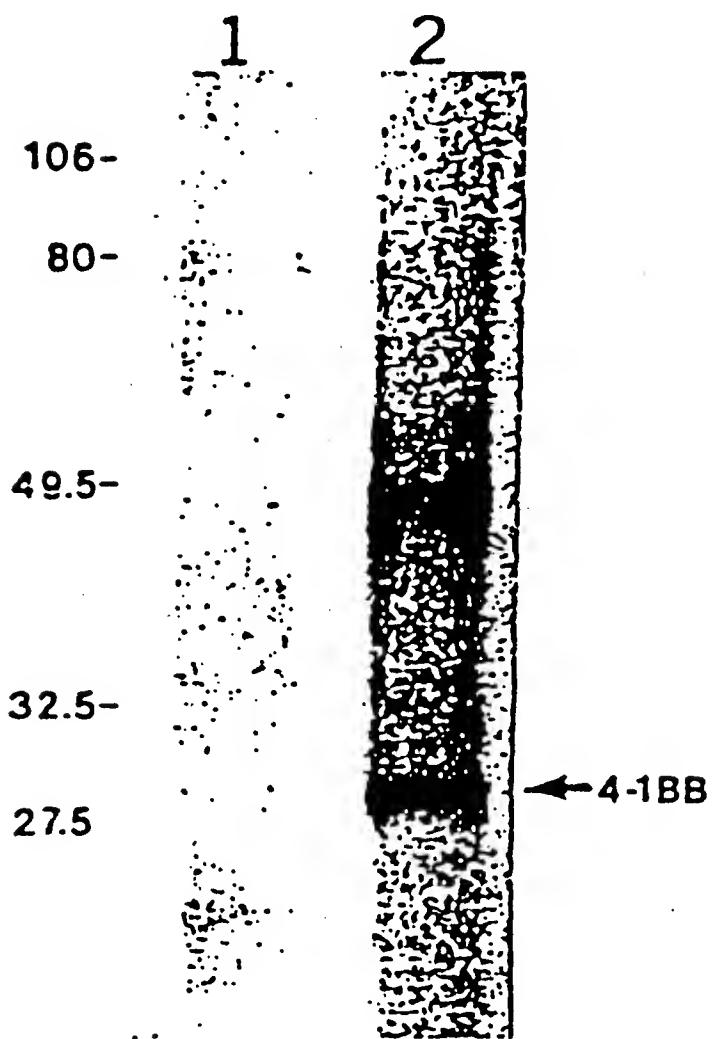


FIG. 29C

TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

30/38

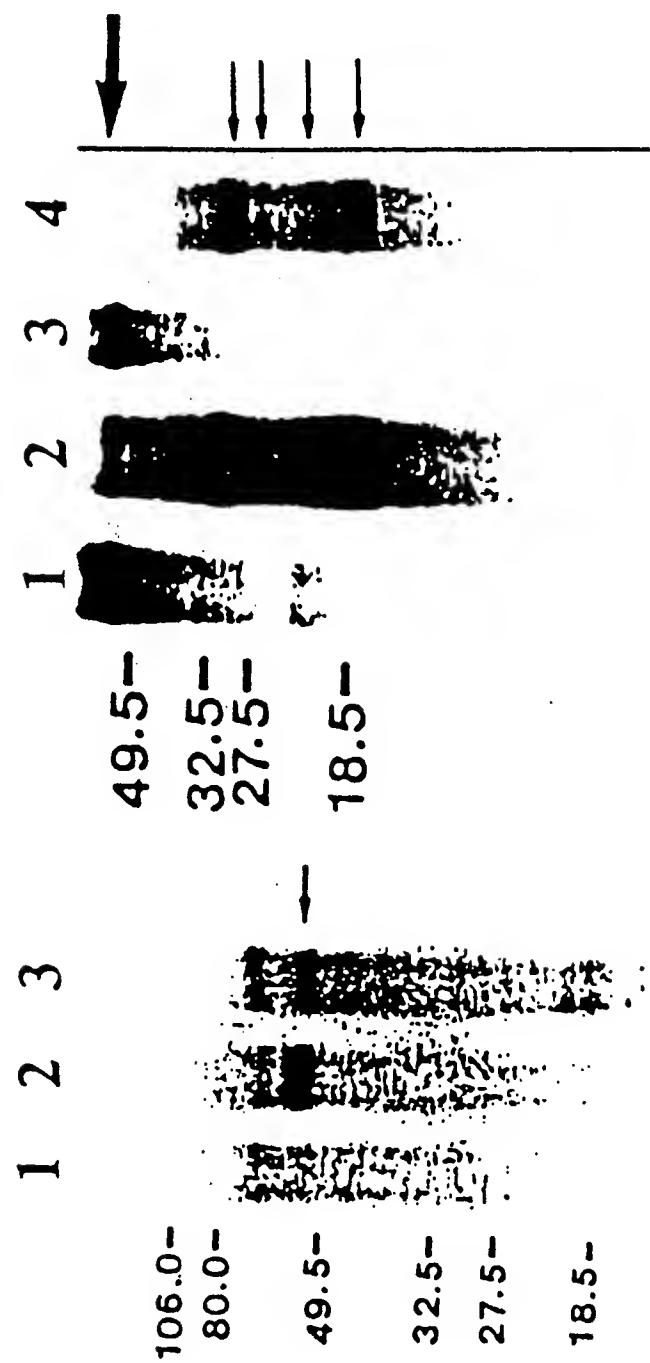


FIG. 30A

FIG. 30B

TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

31/38

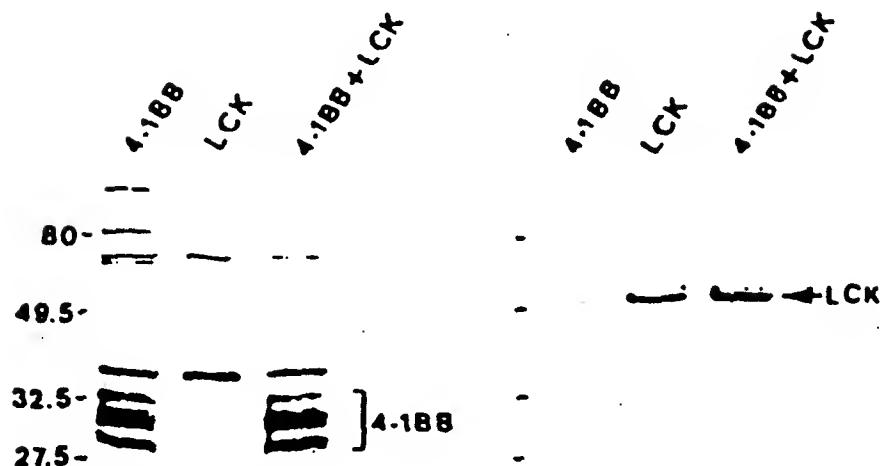


FIG. 31A

FIG. 31B

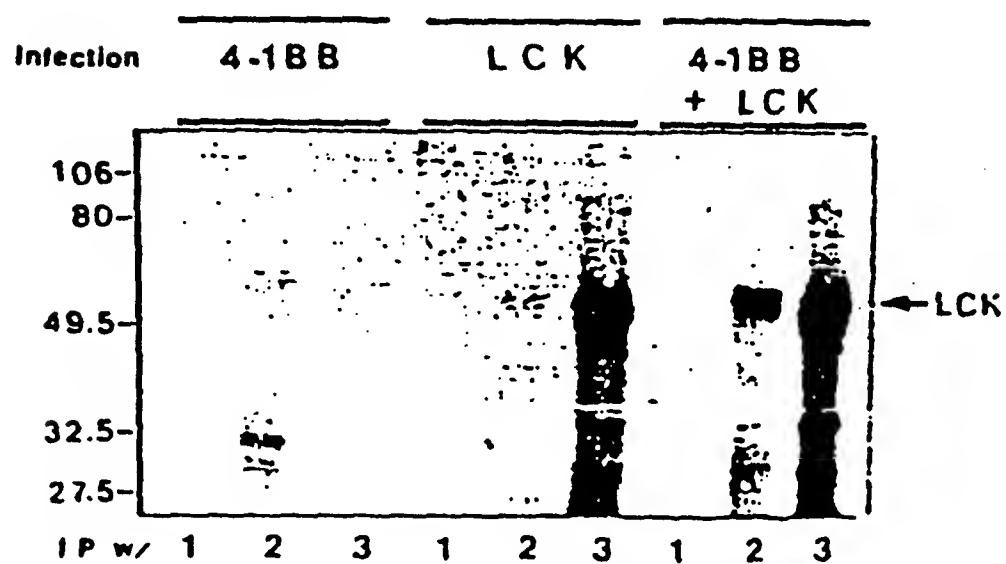


FIG. 31C

TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

32/38

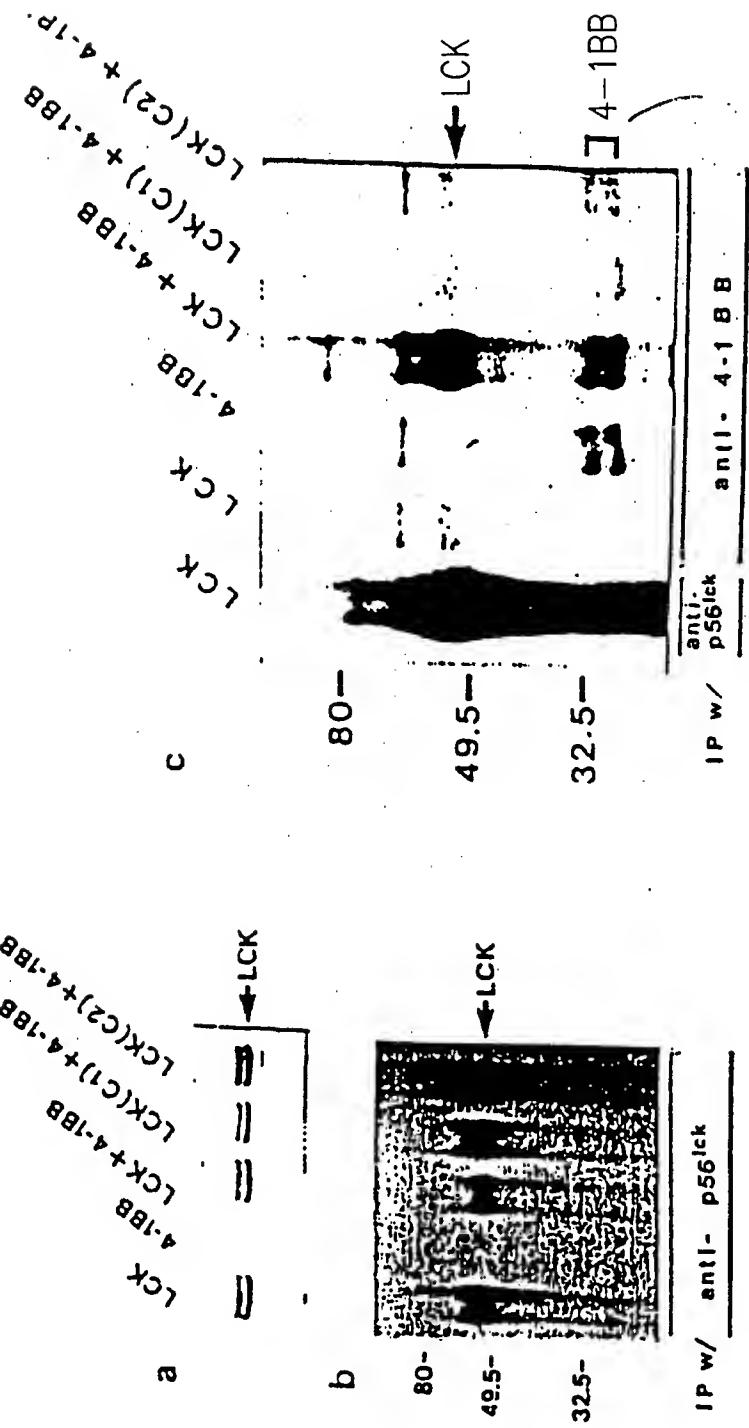


FIG. 32A

FIG. 32B

TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

33/38

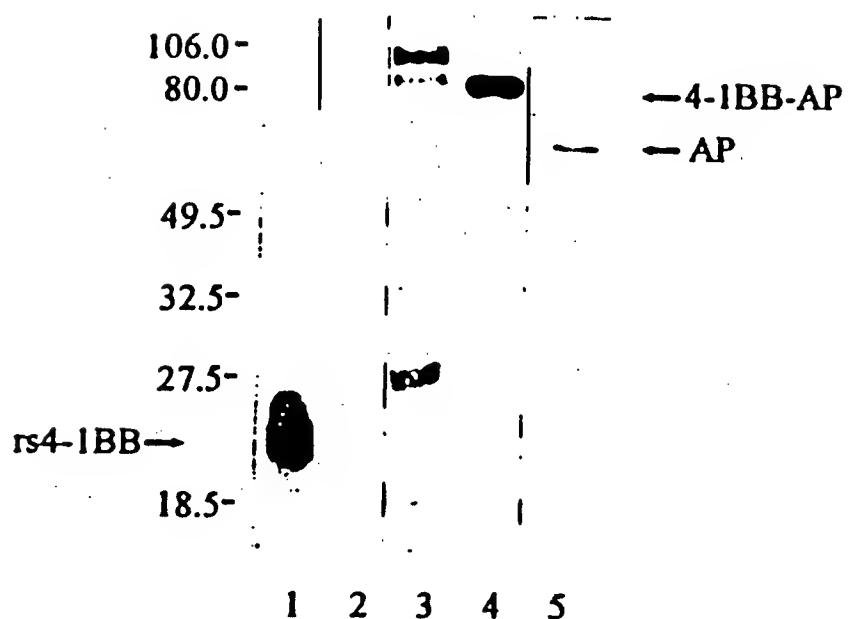


FIG. 33

TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

34/38

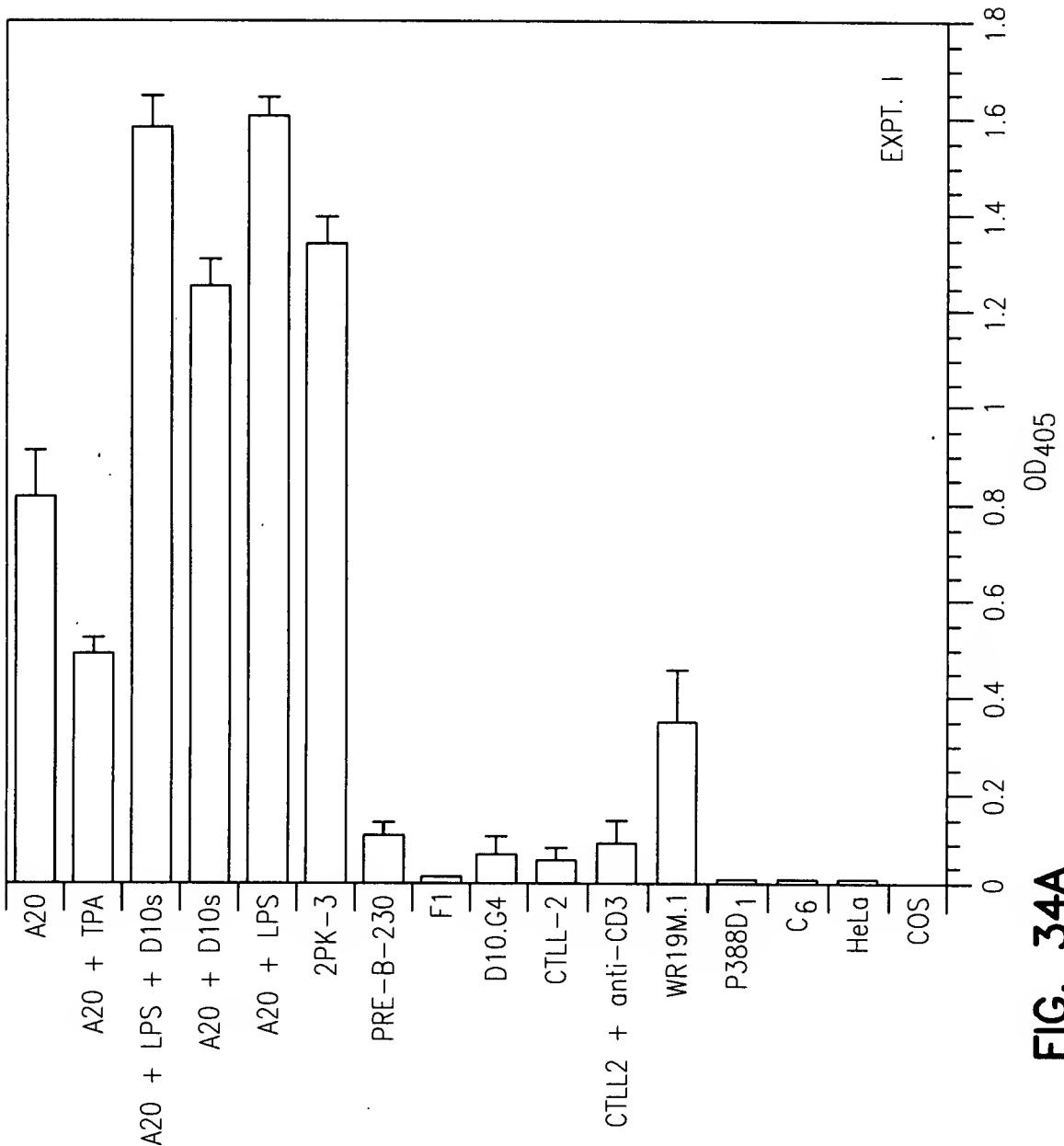


FIG. 34A

TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

35/38

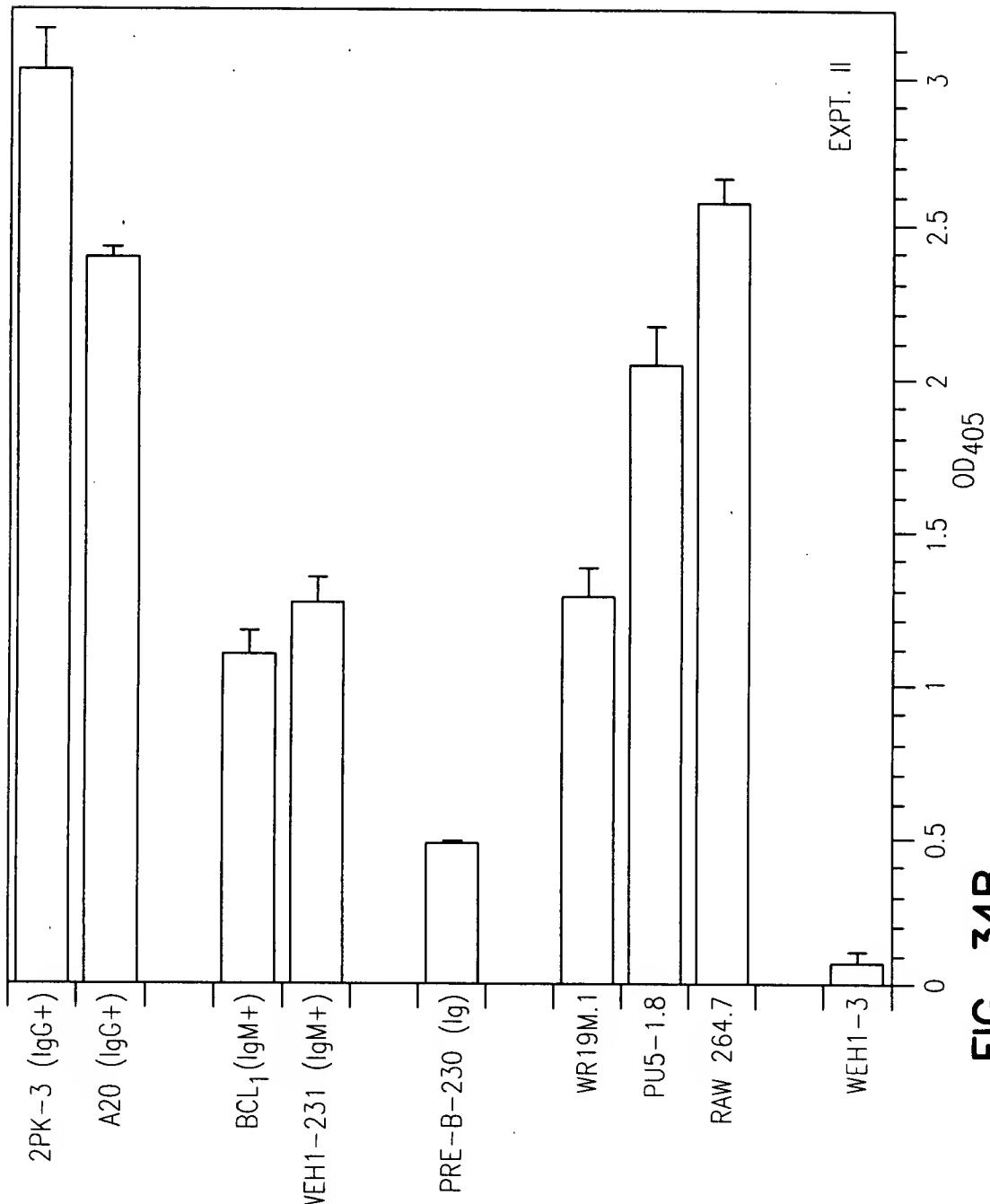


FIG. 34B

TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

36/38

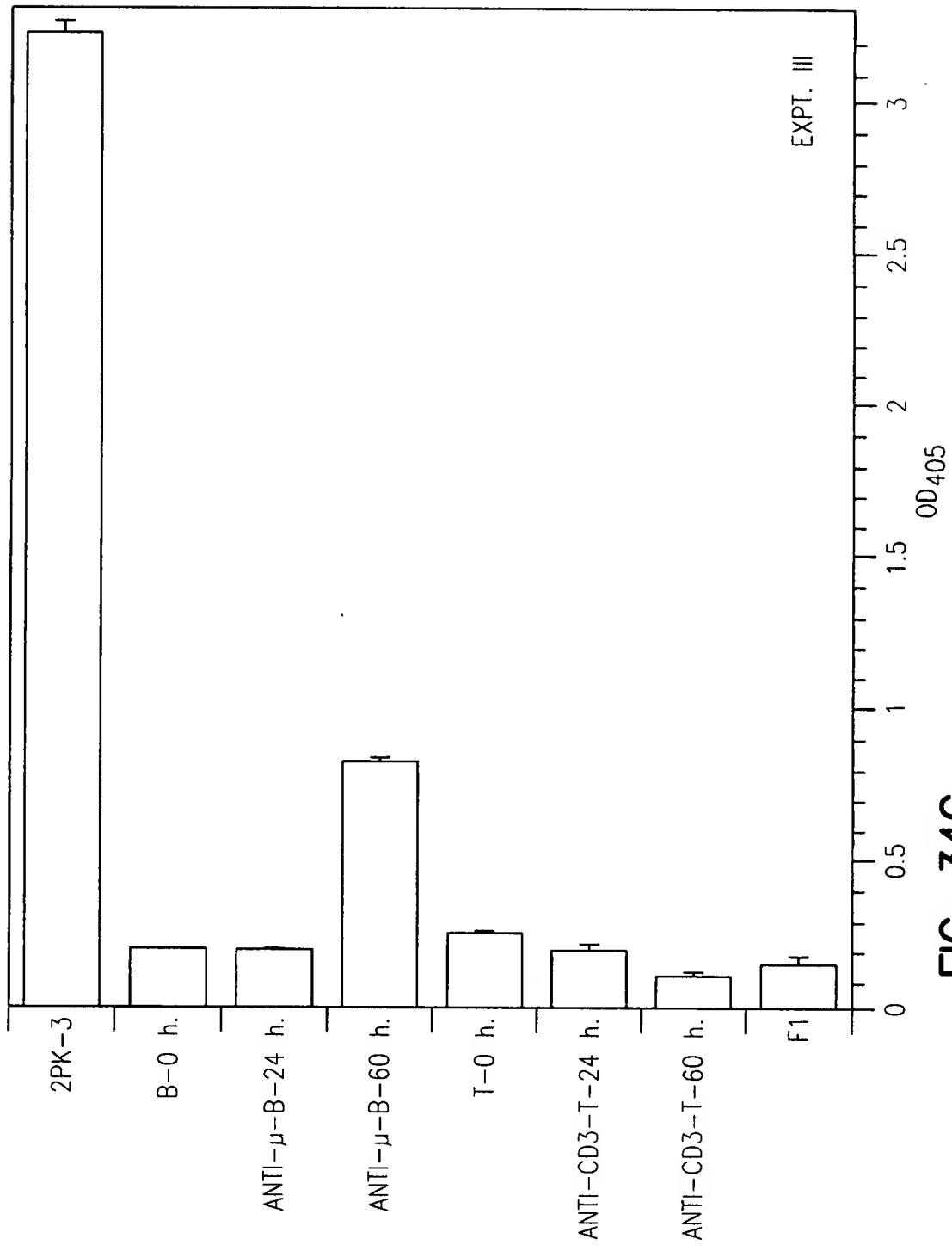


FIG. 34C

37/38

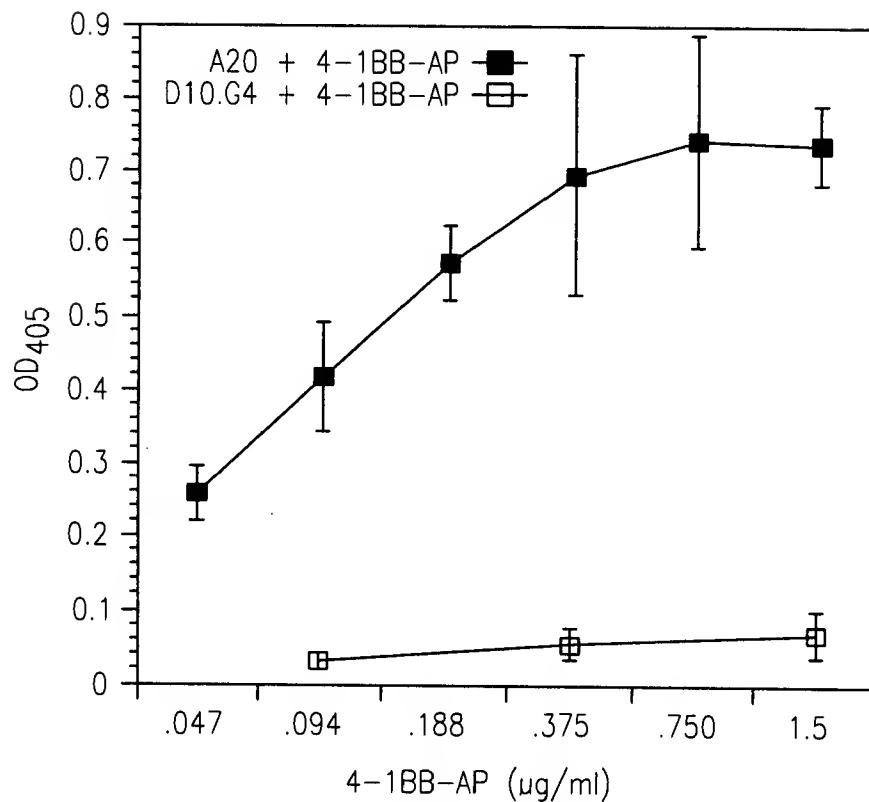


FIG. 35A

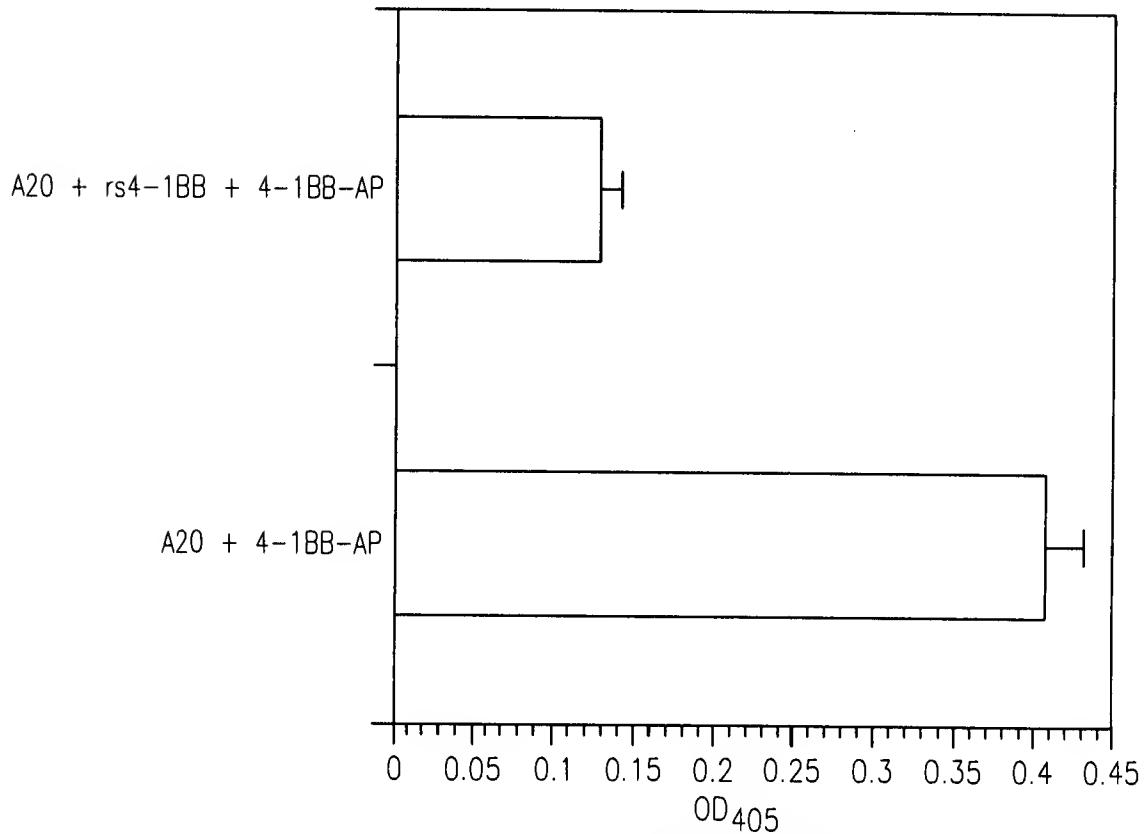


FIG. 35B

TITLE: MURINE 4-1BB GENE (as amended)  
INVENTORS NAME: Byoung S. Kwon  
SERIAL NO.: 08/012,269

38/38

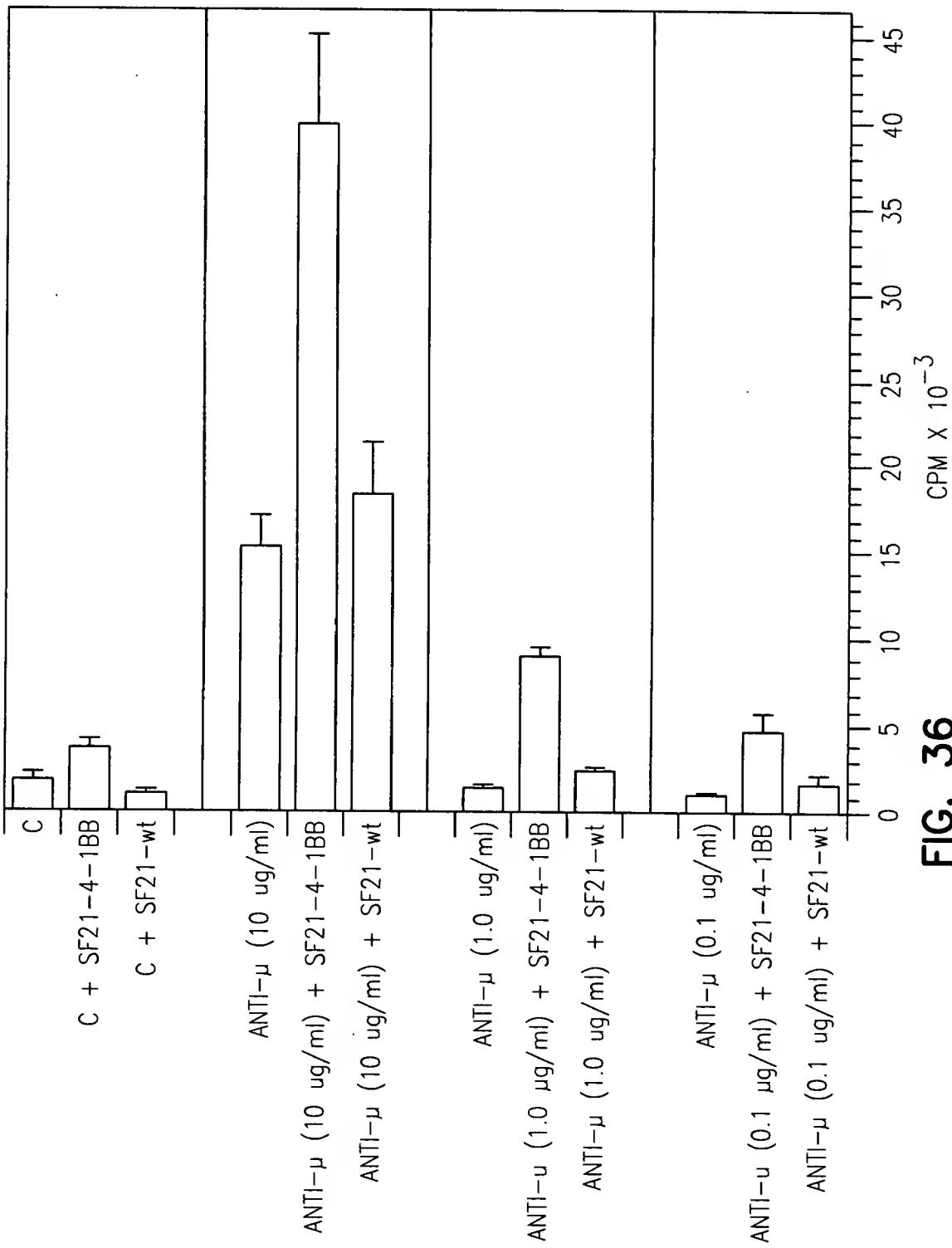


FIG. 36